Casemix Service
HRG4

NHS

The Information Centre
for health and social care

HRG4 Grouper
Reference Manual

The Health and Social Care Information Centre
is England's central, authoritative source
of health and social care information

The National Casemix Office designs and refines
classifications that are used by the NHS in
England to describe healthcare activity

Contents

1 Quick Start

This Quick Start section is intended to provide a brief overview of how to download, install and start using the HRG4 Grouper application. For more detailed information, users are advised to read this reference manual in its entirety.

1.1 Download and Install the Grouper

1) Visit the downloads section of the Casemix Service website
   www.ic.nhs.uk/casemix/downloads
2) Click on either **Payment** or **Costing**.
3) Click on the link for the Grouper application.
4) Click on the Grouper application link in the Download section at the bottom of the screen.
5) Save the Zip file to an appropriate location on your computer.
6) Open the Zip file and extract the Grouper application.
7) Double-click the Grouper application file and follow the installation setup wizard.

1.2 Grouping Walkthrough Using Sample Data

The following walkthrough describes the process of grouping a sample input file, available from the Casemix website.

1) Download the sample input file from the casemix website:
   www.ic.nhs.uk/hrg4groupermanual.

2) Open the Grouper application.

3) Select **Admitted Patient Care HRG4** in the **Database** drop-down list.

4) Click the **Browse…** button next to the **Record Definition File** drop-down list.
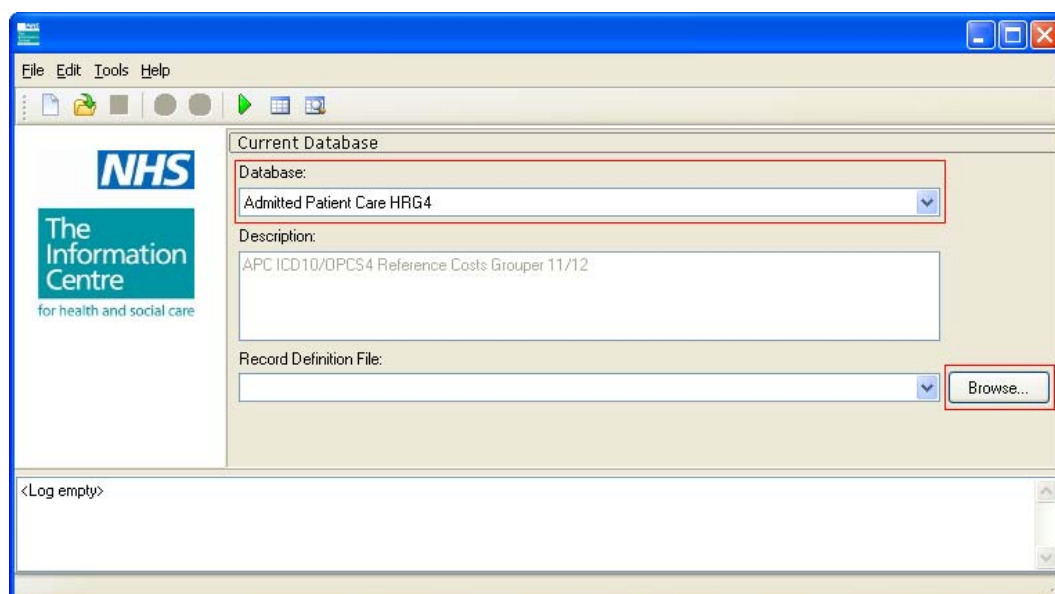
5) In the 'Open' form, browse for the Sample RDF. The sample RDFs are located in the Grouper's installation folder, by default this is a sub-folder of `C:\Program Files\NHS IC\`.

6) Open the file '`HRG4_sample_APC.rdf`'.
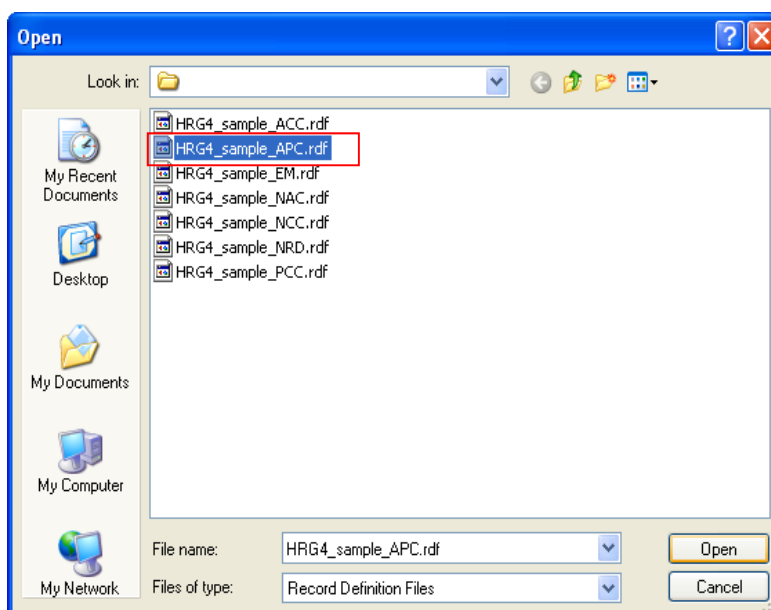
7) From the **Tools** menu select **Process File…**

8) Click the browse button (folder icon) to the right of the **Input File** field.

9) In the 'Open' form, browse to and select the downloaded sample input file.
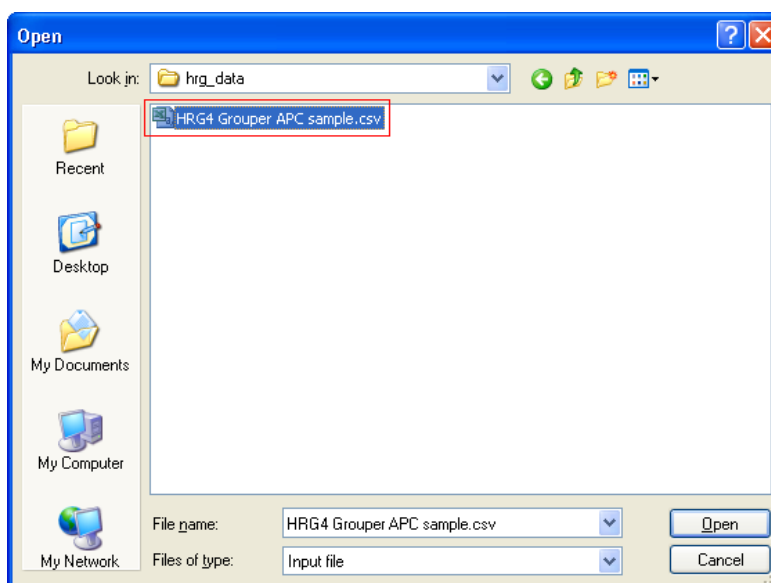
10) Click **Open**.

11) Ensure that the **Input data has headings** box is checked.

12) Click the browse button (folder icon) next to the **Output File** field.

13) In the 'Save As' form, browse to the folder containing the input file and type 'output' in the **File name** box.

14) Click **Save**. The path and filename of the output file are displayed in the **Output File** field.
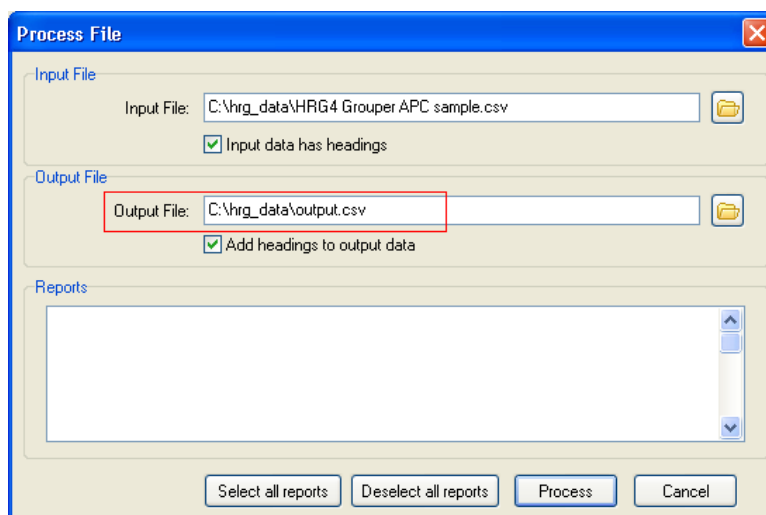
15) Ensure that the **Add headings to output data** box is checked.

16) Click the **Process** button.

A progress bar is displayed during grouping. The application returns to the main screen when grouping is completed.

The log display area shows information about the grouping session, including the number of records grouped.
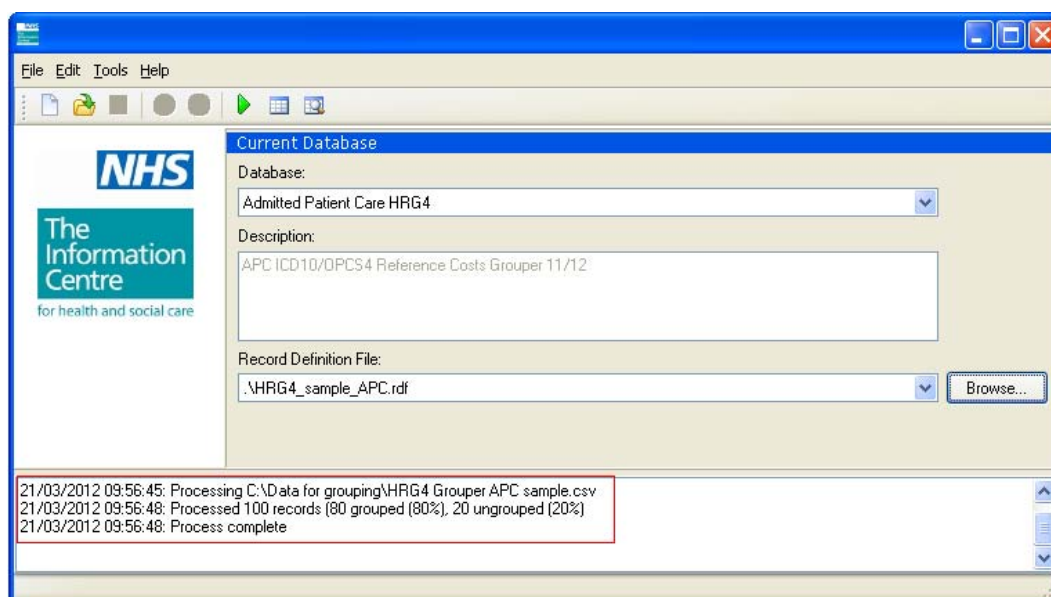
17) Open Windows Explorer and browse to the folder specified for the output file.

18) Open the file 'output_FCE.csv' in Microsoft Excel. The file is a copy of the input file with HRGs and other related columns appended.

19) Scroll to the far-right of the file to view the columns that the Grouper has appended.

1.3 Grouping Your Own Data

Matching the Data and Record Definition File

In order to group data correctly it is essential that the input file and Record Definition File (RDF) are compatible. This can be achieved by either of the following approaches:

1. Create an input file that matches one of the sample RDFs provided with the Grouper installation.

If this approach is taken then the sample RDF for the type of data to be grouped should be examined in order to understand the field positions. This can be done from within the Grouper application by selecting **Open RDF…** from the **File** menu and browsing within the application's installation folder for the required file. The selected RDF is displayed in a grid within the Grouper.

The Grouper installation includes one sample file for each type of data that the Grouper can process (e.g. Admitted Patient Care data). The names of all the sample RDF files and their data types are listed in the 'Record Definition File' section of this document.

The fields in the RDF are referred to by abbreviated names. The fields are described in detail in the 'Input File Preparation' section of this document.

2. Create a custom RDF that matches the format of an input file.

An RDF to match an existing input file can be created using tools provided within the Grouper application. This is explained in the 'Record Definition File' section of this document.

Field Positions

To group data correctly it is essential that the field positions in the input file match the field positions specified in the RDF being used. The Grouper application relies entirely on the RDF to interpret the contents of the input file. If the field positions in the input file do not match exactly those specified in the RDF being used then it is likely that data will be grouped incorrectly.

Grouping

Once an input file and matching RDF are available, grouping simply consists of following the Grouping Walkthrough above, substituting the appropriate input file and RDF.

2 Input File Preparation

This section provides guidance about preparing input files for processing with the Grouper.

2.1 Input files

The Grouper is capable of processing data for the following types of activity:

- Admitted Patient Care
- Non-Admitted Consultations
- Emergency Medicine
- Adult Critical Care
- Neonatal Critical Care
- Paediatric Critical Care
- Renal Dialysis (National Renal Dataset)

Due to differences in the way HRG4 definitions are applied to the above activity types and differences in the fields required to correctly assign the HRGs for each, the Grouper can process files containing a single activity type only; files consisting of a combination of activity types cannot be processed.

File Format

Input data must be in comma-separated value (CSV) format using the standard American Standard Code for Information Interchange (ASCII) character set, excluding the non-printing ASCII characters. The input file must not include qualifiers, such as quotes, surrounding the fields.

Using Excel for File Preparation

If some of the records end with empty fields then a file structure issue can arise when saving a text file using Microsoft Excel (For more information please refer to Microsoft Article ID 77295 "Column delimiters are missing in an Excel spreadsheet that is saved as text"). To prevent this issue arising, ensure that the final (rightmost) column of data is populated for every record in the file with 'dummy data' such as "x".

Field Order

The input file field lists in this document are not intended to imply a field order for the input data; the field order of the input data is specified in the Record Definition File (RDF). Where one of the sample RDFs supplied with the Grouper installation is used, the input data field order must match the field order in the sample RDF.

Chemotherapy and Radiotherapy

Data required for the derivation of certain HRGs, e.g. Chemotherapy and Radiotherapy treatments, may not be captured in the local Patient Administration System (PAS). Where these data are collected in specialist departmental systems only, local arrangements will be required to ensure that the data can be incorporated into admitted care or outpatient datasets for HRG grouping. Users must ensure that input files contain appropriate records as specified by Department of Health Payment by Results guidance.

Input File Validation

Three stages of validation are applied to the input file during processing:

- Field values within a record
- Cross-validation of related records (e.g. consultant episodes within a spell)
- Grouping logic

The HRG **UZ01Z Data Invalid for Grouping** is returned in the output record if validation is failed. Errors in the input data are reported in the `_quality.csv` output file. There may be more than one reason why an HRG cannot be assigned so each row in the `_quality.csv` file may contain several error messages; all reported errors must be addressed in order to allow the record to be grouped. See the later section 'Error Reporting' for further information.

For Admitted Patient Care data the quality file may include valid episodes that form part of spells containing episodes that failed validation i.e. some of the episodes in the `_quality.csv` output file may be valid episodes that have been grouped. Such records do not include error messages.

Completeness of Records

Each record must contain all the fields listed in the Record Definition File; the Grouper cannot detect whether specific fields are missing from an input file. All records within an input file must contain the same number of fields. Where fields are not populated (e.g. where there are fewer procedure codes than available fields), the commas that delimit the fields must still exist in the file to represent the empty fields.

Validation of Clinical Codes (Procedure and Diagnosis codes)

Points (full stops) must be removed from clinical codes otherwise validation will reject the code. For example, 'F15.2' would be rejected by the Grouper whereas 'F152' would be accepted.

To remove points from clinical codes, either:
- Use the Grouper's 'Extract' feature to remove them during processing (see the 'Extract' section of this document) or
- Remove the point from each code in the input file prior to processing

Approaches and Sites

In some cases the assignment of an HRG based on an OPCS-4 code depends on the presence of other OPCS-4 codes, indicating approach or site. Such codes should appear immediately after the procedure to which they relate unless national clinical coding guidance specifically states otherwise. The Grouper does not apply a single site code or approach code to a group of procedures.

The table below shows the procedure coding for two episodes:

Episode Number	Procedure 1	Procedure 2	Procedure 3	Procedure 4
1	J106	J104	Z393	
2	J106	Z393	J104	Z393

In the first episode, the site recorded as Z393 "Portal vein" is taken to refer only to the J104 angioplasty procedure and is not applied to the J106 thrombolysis procedure. If both procedures are performed on the portal vein then the record must be recorded as shown in the second episode.

2.2 Input File Fields

The following input file field lists contain a 'Validation/Notes' column which in many cases refers to a valid national code; the national codes are available from the NHS Data Dictionary.

2.2.1 Admitted Patient Care

The Grouper sorts Admitted Patient Care data prior to processing so that records with the same Provider Code and Provider Spell Number are placed in Episode Number order, improving spell-level processing speed.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Field Name	Description	Format	Validation/Notes
PROCODET	Provider Code	an8	The provider Organisation Data Services (ODS) code is recommended. Maximum length 8 characters. Any characters in excess of 8 are ignored in sorting, this may result in incorrect grouping. A value must be supplied.
PROVSPNO	Hospital Provider Spell Number	an24	Local Spell Identifier. Maximum length 24 characters. Any characters in excess of 24 ignored in sorting, this may result in incorrect grouping. A value must be supplied.
EPIORDER	Episode Number	n2	Must be distinct within a Spell. Range: 1 – 87. The NHS Data Dictionary states that "A known EPISODE NUMBER can be between 01 to 87". Spells containing more than 87 episodes are not recognised by the Grouper.
STARTAGE	StartAge	n3	The age of the patient in whole years at the start date of the episode. Range: 0 – 130. For babies and children under one year of age, the age value should be zero (HES baby age codes are not accepted). The age increase between episodes, relative to episode duration, is validated.
SEX	Sex	n1	Valid national Person Gender Code. Where Sex is a determinant of the HRG, the value must be either 1 or 2 (male or female). Must be same for all FCEs in a Spell.

Field Name	Description	Format	Validation/Notes
CLASSPAT	Patient Classification	n1	Valid national code. Must be the same for all episodes within a Spell.
ADMISORC	Source Of Admission (Hospital Provider Spell)	n2	Valid national code. Must be the same for all episodes within a Spell.
ADMIMETH	Admission Method (Hospital Provider Spell)	n2	Valid national code. Must be the same for all episodes within a Spell.
DISDEST	Discharge Destination (Hospital Provider Spell)	n2	Valid national code.
DISMETH	Discharge Method (Hospital Provider Spell)	n1	Valid national code.
EPIDUR	Episode Duration	n5	Range: 0-99999. Whole days. In data preparation this should be calculated as Episode End Date – Episode Start Date (in days).
MAINSPEF	Main Specialty Code	n3	Valid national code.
NEOCARE	Neonatal Level of Care	n1	Valid national code or blank. 8 (Not applicable) or blank may be used if not relevant.
TRETSPEF	Treatment Function Code	n3	Valid national code.
DIAG_01	Primary Diagnosis (ICD-10)	an5	Valid ICD-10 code (excluding decimal point character and any dagger/asterisk suffix). Decimal points are not accepted. Any dagger/asterisk suffix must be removed, for example, use A170 rather than A17.0† or A17.0D.
DIAG_02 - DIAG_99	Additional diagnoses	an5	As above or blank. Not all fields are present by default; the number of fields may be specified by the user in the Record Definition File.

Field Name	Description	Format	Validation/Notes
OPER_01 - OPER_99	Procedure Codes (OPCS-4)	an4	Valid OPCS-4 codes (excluding decimal point character) or blank. Decimal points are not accepted. For example, use F343 rather than F34.3. Not all fields are present by default; the number of fields may be specified by the user via the Record Definition File.
CRITICAL CAREDAYS	Critical Care Days	n5	Range: 0-99999 or blank. Non-numeric characters are treated as zero. Blank or zero where the user has already removed Critical Care days from the data or where there are no Critical Care days.
REHABILITATION DAYS	Rehabilitation Days	n5	Range: 0-99999 or blank. Non-numeric characters treated as zero. Used in the output as the per diem multiplier for rehabilitation HRGs and deducted from episode duration prior to HRG derivation.
SPCDAYS	Specialist Palliative Care Days	n5	Range: 0-99999 or blank. Non-numeric characters treated as zero. Used in the output as the per diem multiplier for Specialist Palliative Care HRGs and deducted from episode duration prior to HRG derivation.

Each row of the input file represents an episode. All records with identical values for the Provider Code and Hospital Provider Spell Number are considered to be part of the same spell.

Provider Code
Provider Code identifies the provider organisation for each record is and this is used in data sorting. It is strongly recommended that the organisation's Organisation Data Services (ODS) code is used. Correct use of this field is particularly important where an input file contains records from more than one provider. The maximum length of the Provider Code field is eight characters. Any extra characters will be ignored in sorting and this is likely to result in incorrect HRGs being allocated.

Hospital Provider Spell Number and Episode Number
The Grouper assigns HRGs at episode and spell level. The link between episodes in the same spell is made by matching Provider Code and Hospital Provider Spell Number.

Where source data systems do not provide Hospital Provider Spell Number and Episode Number (or equivalents) then a proxy will be required in these fields within the submitted file. For Episode Number a simple incremental count may be used. A proxy Spell Number can be created by either of the following methods:

- Concatenate local patient identifier, Admission Date and Admission Time to create a proxy spell number. Admission Time is required in order to identify separate spells starting on the same date.
- Where unique episode identifiers are assigned then use the first episode identifier within the spell as the Spell Number.

The maximum length of Hospital Provider Spell Number for Grouper data is 24 characters. Any extra characters will be ignored in sorting and this is likely to result in incorrect HRG allocation.

Discharge Destination and Discharge Method
Derivation of some HRGs is influenced by Discharge Destination and Discharge Method. Some hospital computer systems use default values (typically the values that represent 'Not Applicable') for Discharge Destination and/or Discharge Method within multi-episode spells.

When grouping multi-episode spells, the Grouper uses Discharge Destination and Discharge Method from the final episode in the spell. To ensure correct grouping of multi-episode spells, the final episode of the spell must contain the actual discharge details for the spell.

In episode grouping, the Grouper uses Discharge Destination and Discharge Method from the episode being grouped. To ensure correct grouping of episodes, all episodes within multi-episode spells must contain the actual discharge details for the spell.

Neonatal Level of Care
Neonatal Level of Care is used by the Grouper to allocate the HRG for Neonatal Critical Care Retrieval (XA06Z). When a patient is not a neonate, a value of 8 (Not applicable) may be supplied or the field may be left blank.

Diagnosis: the ICD-10 Dagger and Asterisk System
ICD-10 uses Dagger and Asterisk codes to capture information about both an underlying generalised disease and a manifestation in a particular organ or site. Hospital computer systems have various ways of representing Dagger and Asterisk and may append the characters 'D', 'A', '+' and '*' to the ICD-10 code. The Grouper does not accept diagnosis codes containing these appended characters and will create a validation error if any are encountered. Any characters used to represent Daggers and Asterisks should be removed from diagnosis codes prior to grouping. The Grouper's internal logic will identify these codes for the purposes of HRG grouping.

Reducing Episode Duration
The Department of Health Payment by Results guidance may require episode and Hospital Provider Spell duration to be reduced by the number of days allocated to certain unbundled HRGs. An example being unbundled HRGs that are generated on a per diem basis such as those for Rehabilitation. For more information, please refer to the DH Payment by Results guidance (www.dh.gov.uk).

The Grouper facilitates the subtraction of days for Critical Care, Rehabilitation and Specialist Palliative Care from Consultant Episode and Hospital Provider Spell durations.

Exclusion of Critical Care Activity
The information below relates specifically to calculating the critical care days to be subtracted from episode duration for HRG grouping. It is not intended to inform the calculation of the number of critical care days for other purposes.

The reason for excluding critical care days from admitted patient care data is to avoid duplicating activity in the two data types. Inpatient and critical care takes place concurrently within critical care periods from a data perspective. For patients having critical care period(s), both the inpatient and critical care data are eligible for HRGs but the duration of the inpatient HRGs must be reduced because the unbundled critical care HRGs account for some or all of the days in hospital. This principle applies to adult, paediatric and neonatal critical care activity.

Before making adjustments, users should ensure that subtracting critical care days from the Consultant Episode and Hospital Provider Spell Duration is in line with current Payment by Results guidance.

It is possible for either the Critical Care Start Date or the Critical Care Discharge Date to be different from the Episode Start Date or the Episode End Date. This means that care must be taken in calculating how many days within an episode and spell have been spent in critical care.

Critical care days are calculated using bed days i.e. each day that a patient is in critical care is included in the calculation of the duration of the critical care period. This means that, unlike episode duration, a critical care period duration of zero days is not possible.

The critical care days to be excluded from the episode duration are those that occur:

- On or after the episode start date
- On or before the episode end date

Care should be taken to avoid counting days twice when calculating the critical care days to subtract from episode duration for HRG grouping. Where a critical care period ends and another starts on the same day, that day should be subtracted only once.

Due to the different methods by which episode duration and critical care duration are calculated, deducting critical care days from episode duration could lead to a negative figure in some situations. Where this is the case in payment Groupers, the adjusted episode duration should be recorded as zero days. Where this is the case for reference costs Groupers, for the purposes of reference costs only, the adjusted episode duration should be recorded as one day.

In hospital computer systems, critical care period records may be allocated to specific admitted patient care episode records for data storage purposes. The exclusion of critical care days for grouping is not related to the way in which critical care period records are stored but is determined by the dates that the patient is in critical care and the start and end dates of the concurrent episodes.

Example Calculations
Example 1: A single day in critical care at the start of a single episode
The patient is in critical care during the first day but leaves critical care before the end of the day. The stay in hospital extends over two nights.

	02/06	03/06	04/06
Episode 1			
CC period 1			
CC day count	1		

- The episode starts on 2nd June and finishes on 4th June so the episode duration is two days
- The total number of critical care days is one
- The adjusted episode duration is therefore one day (2-1=1)

Example 2: No break in critical care

In the example illustrated below, the inpatient episode starts on 2nd June and finishes on 11th June and thus the episode duration is nine days. There are three consecutive critical care periods. The total number of days spent in critical care is eight. The adjusted episode duration is therefore one day (9-8=1).

	02/06	03/06	04/06	05/06	06/06	07/06	08/06	09/06	10/06	11/06
Episode										
CC period										
CC period										
CC period										
CC day		1	2	3	4	5	6	7	8	

Example 3: Breaks in critical care

Although the hours spent in critical care are fewer in this example than in the example above, the total number of critical care days is the same (eight). This results in the adjusted episode duration being one day, as above.

	02/06	03/06	04/06	05/06	06/06	07/06	08/06	09/06	10/06	11/06
Episode										
CC period										
CC period										
CC period										
CC day		1	2	3	4	5	6	7	8	

Example 4: A single critical care period spans more than one episode

In this case a decision must be made regarding the apportionment of the critical care days that occur at the junction of two episodes (critical care days three and five); these days must be apportioned to one or other of those episodes but not both. To avoid double-counting it is important to ensure that any critical care day is not apportioned to more than one episode.

Note that in situations where a critical care day occurs on the end date of one episode and on the start date of another episode, the Secondary Uses Service (SUS) attributes the critical care day to the later episode.

	02/06	03/06	04/06	05/06	06/06	07/06	08/06	09/06	10/06	11/06
Episode 1										
Episode 2										
Episode 3										
CC period										
CC day		1	2	3	4	5	6	7	8	

In this example, the allocation of critical care days to episodes could be done using either of the two approaches below:

1. Critical care day three allocated to episode two and critical care day five allocated to episode three:

- Episode one adjusted duration: one day (3-2=1)
- Episode two adjusted duration: zero days (2-2=0) [1 for reference costs]
- Episode three adjusted duration: zero days (4-4=0) [1 for reference costs]

The adjusted spell duration is one day (1+0+0=1) [3 for reference costs (1+1+1=3)].
The above is consistent with the approach taken by SUS.

2. Critical care day three allocated to episode one and critical care day five allocated to episode two:
- Episode one adjusted duration: zero days (3-3=0) [1 for reference costs]
- Episode two adjusted duration: zero days (2-2=0) [1 for reference costs]
- Episode three adjusted duration: one day (4-3=1)

The adjusted spell duration would therefore be one day (0+0+1=1) [3 for reference costs (1+1+1=3)].

It is important to note that where there is a choice of episode to which critical care days may be apportioned (i.e. at episode junctions), the same approach should be adopted consistently within spells. Critical care days at the beginning/end of episodes should be apportioned either to the beginning or end of episodes but not a mixture of both. This means that critical care days three and five should not both be allocated to episode three in this example.

Automatic Adjustment for Critical Care Days
The Grouper application provides a facility to remove critical care days as part of the grouping process. To use this facility the field CRITICALCAREDAYS for each Consultant Episode record should be populated with the number of critical care days that are to be removed from that Consultant Episode's duration.

If critical care days have already been removed from the data or there are no critical care days to be removed, the field CRITICALCAREDAYS should either be left blank or populated with zeroes.

The output field CalcEpidur contains the adjusted value. In Reference Costs Grouper the output field ReportingEPIDUR (blank for payment Groupers) contains the adjusted value; this field has a minimum value of one day for ordinary admissions (Patient Classification=1).

Rehabilitation and Specialist Palliative Care Activity
The APC input file includes the fields REHABILITATIONDAYS and SPCDAYS. These should be populated with the number of discrete rehabilitation days and specialist palliative care days, respectively, for each episode that contains appropriate activity. These fields are used in two ways by the Grouper:

- To provide the per-diem multipliers in the unbundled HRG output for Rehab and SPC.
- For automatic exclusion of days to avoid double-counting of activity.

The fields may be set to zero or left blank for records where there are no applicable days.

Rehabilitation Days
The field REHABILITATIONDAYS should be populated with days where *discrete* rehabilitation has taken place. For the purposes of HRG derivation, in accordance with national clinical coding guidance (OPCS-4 codes U50-U54), discrete rehabilitation refers to a patient being either admitted specifically to a rehabilitation unit or transferred to a rehabilitation specialty. This does NOT refer to rehabilitation when it is part and parcel of a normal treatment plan; as such activity cannot be captured using primary classifications.
In the unlikely event that data indicate discrete rehabilitation and critical care have taken place at the same time, the rehabilitation days should be reduced to account for critical care days.

Specialist Palliative Care Days

If the following conditions are met by a consultant episode record then an adjustment for Specialist Palliative Care should be made in the field SPCDAYS:

- Treatment Function Code is 315 AND Main Specialty Code is any of:
    - 315 (Palliative Medicine)
    - 950 (Nursing Episode)
    - 960 (Allied Health Professional Episode).

These conditions mirror the criteria that the Grouper uses to identify entire episodes of specialist palliative care.

Unbundled specialist palliative care HRGs are also derived for episodes outside of treatment function code 315 where the ICD-10 code Z51.5 is present. There should be no adjustment to episode duration in these cases because the HRGs derived in these cases are for specialist palliative care *support* rather than specialist palliative care. Patients are not under the care of a specialist palliative medicine consultant but receiving input from a specialist palliative care specialist support service.

The number of days to enter in the SPCDAYS field depends on whether or not the Specialist Palliative Care consultant episode includes critical care:

- Where there is no critical care then SPCDAYS should be populated with the number of days of the entire episode duration. This will cause the Grouper to generate one Specialist Palliative Care HRG for each day of the consultant episode and adjust the value of the output field CalcEpidur to zero.

- Where there is critical care during the Specialist Palliative Care episode, the number of days used to populate SPCDAYS must be the episode duration minus the number of critical care days. This is on the basis that, from an HRG viewpoint, the patient is primarily receiving either Specialist Palliative Care or critical care. CRITICALCAREDAYS should be populated with the critical care days as described above.

Per-Diem Unbundled HRG Multipliers

Rehabilitation and Specialist Palliative Care unbundled HRGs are produced on a per-diem basis, i.e. one unbundled HRG per day. Where there are multiple Rehabilitation or Specialist Palliative Care HRGs, instead of repeating the HRG, the unbundled HRG in the FCE output file is in the format:

The HRG, followed by an asterisk, followed by the number of days.

For example, VC18Z*20 indicates VC18Z for 20 days. The number of days for the multiplier is taken from the REHABILITATIONDAYS or SPCDAYS column as appropriate.

2.2.2 Non-Admitted Consultations

Non-admitted Consultations are outpatient attendances or attendances by patients for nursing care on a ward (ward attenders). Since April 1st 2005 the Outpatient Attendance CDS has contained both of these types of data.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Field	Description	Format	Validation/Notes
STARTAGE	Age	n3	The age of the patient in whole years at the date of the appointment. Range: 0 – 130.
SEX	Sex	n1	Valid national Person Gender Code. Where Sex is a determinant of the HRG the value must be either 1 or 2 (male or female).
MAINSPEF	Main Specialty Code	n3	Valid national code.
TRETSPEF	Treatment Function Code	n3	Valid national code.
FIRSTATT	First Attendance	n1	Valid national code.
OPER_01 - OPER_99	Procedure Codes (OPCS-4)	an4	Valid OPCS-4 codes or blank. Decimal points are not accepted. Not all procedure fields are present by default; the number of fields may be specified by the user in the Record Definition File.

Each row of the input file represents a single attendance.

Diagnosis Codes
Diagnostic coding is excluded from the HRG4 algorithm for non-admitted care.

2.2.3 Emergency Medicine

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Field	Description	Format	Validation/Notes
AGE*	Patient age	n3	The age of the patient in whole years at the date of arrival. Range: 0 – 130.
INV_01 - INV_99	Accident and Emergency Investigation Codes	an2	Valid national code component or blank. The national component of the code is the "Investigation" part only. The "Local Sub-Analysis" part is not accepted. Leading zeroes must be included where they form part of the national code component. Not all investigation code fields are present by default; the number of investigation codes may be specified by the user in the Record Definition File.
TREAT_01 - TREAT_99	Accident and Emergency Treatment Codes	an3	Valid national code components or blank. The national components of the code are the "Condition" and "Sub-Analysis" (where appropriate) parts only. The "Local Use" part of the code is not accepted. Leading zeros must be included where they form part of the national code component. Not all treatment fields are present by default; the number of treatment codes may be specified by the user in the Record Definition File.

*AGE is validated but is not used in HRG derivation (required for consistency with SUS validation).

Each row of the input file represents one Accident and Emergency Attendance.

A record containing only Accident and Emergency Investigation Code 24, 'None' (indicating no investigation has taken place) will group to **VB11Z No investigation with no significant treatment**. Although any of the investigation and treatment fields may be left blank, a record where ALL fields are blank will group to **UZ01Z Data Invalid for Grouping**.

Investigation Codes
The investigation fields in the A&E CDS can contain up to six alpha-numeric characters. Only the two leading characters are the national code, the last four positions are locally assigned values. These fields must be truncated to the two leftmost characters in the input file. Leading zeroes must be included where they form part of the national code (e.g. '01' is valid but '1' is not). Accident and Emergency Investigation codes are defined in the NHS Data Dictionary.

Treatment Codes

Within the Accident and Emergency Attendance CDS, treatment fields can contain up to six alpha-numeric characters. The code structure is:

Condition	n2
Sub-Analysis	n1
Local Use	up to an3

Depending on the code, either the leftmost two characters or the leftmost three characters indicate the national code, with the remainder of the field containing locally assigned values. These fields must be truncated in the input file to the national code as appropriate. Leading zeroes must be included where required (e.g. '01' is valid but '1' is not). Accident and Emergency treatment codes are defined in the NHS Data Dictionary.

2.2.4 Renal Dialysis (National Renal Dataset)

Renal Dialysis HRGs are generated using fields from the National Renal Dataset.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Field	Description	Format	Validation/Notes
RENALMOD	Renal Treatment Modality	n2	Valid national code. Numbers less than 10 must include a leading zero.
RENALSITE	Treatment Supervision Code	n2	Valid national code. Numbers less than 10 must include a leading zero.
RENALACCESS	Type of dialysis access	n2	Valid national code or blank. Numbers less than 10 must include a leading zero.
HBV	Hepatitis B Surface Antigen Status	a3	Valid national code or blank. Must be UPPER CASE. Accepted values are NEG, POS and UNK.
HCV	Hepatitis C Antibody Status	a3	Valid national code or blank. Must be UPPER CASE. Accepted values are NEG, POS and UNK.
HIV	HIV blood test	a3	Valid national code or blank. Must be UPPER CASE. Accepted values are NEG, POS and UNK.
AGE	Patient age	n3	The age of the patient in whole years at the start date of the session. Range: 0 – 130.

Each row of the input file represents either one haemodialysis session or one day of peritoneal dialysis.

2.2.5 Adult Critical Care

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Field	Description	Format	Validation/Notes
CCUF	Critical Care Unit Function Code	an2	A national code valid for adults. Must be two characters. Include any leading zero.
BCSD	Basic Cardiovascular Support Days	n5	Range: 0 – 99999.
ACSD	Advanced Cardiovascular Support Days	n5	Range: 0 – 99999.
BRSD	Basic Respiratory Support Days	n5	Range: 0 – 99999.
ARSD	Advanced Respiratory Support Days	n5	Range: 0 – 99999.
RSD	Renal Support Days	n5	Range: 0 – 99999.
NSD	Neurological Support Days	n5	Range: 0 – 99999.
DSD	Dermatological Support Days	n5	Range: 0 – 99999.
LSD	Liver Support Days	n5	Range: 0 – 99999.
CCL2D	Critical Care Level 2 Days	n5	Range: 0 – 99999.
CCL3D	Critical Care Level 3 Days	n5	Range: 0 – 99999.
CC_Start_Date*	Critical Care Start Date	n8	Format is CCYYMMDD. e.g. 14 March 2009 = 20090314.
CC_Discharge_Date*	Critical Care Discharge Date	n8	Format is CCYYMMDD. e.g. 14 March 2009 = 20090314.

*Critical Care Start Date and Critical Care Discharge Date fields are used to calculate critical care days in the Grouper output file. They are not used in HRG derivation.

Each row of the input file represents one Critical Care Period.

CDS field 'ORGAN SUPPORT MAXIMUM' is not required because it is not used in HRG derivation.

2.2.6 Paediatric Critical Care

The Grouper sorts Paediatric Critical Care data prior to grouping so that records with the same provider code and local identifier are placed in activity date order.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Field	Description	Format	Validation/Notes
PROCODET	Provider Code.	an8	The provider's Organisation Data Services (ODS) code is recommended. Any characters in excess of eight will be ignored in sorting, possibly causing incorrect grouping. A value must be supplied.
CCLocalID	Critical Care Period local identifier. Identifies the records that belong within a Critical Care Period.	an8	Each Critical Care Period must have a different identifier. The identifier is repeated for daily records that belong in the same Critical Care Period i.e. this is not a unique record identifier. Any characters in excess of eight will be ignored in sorting, possibly causing incorrect grouping. A value must be supplied.
CCDate	Activity Date (Critical Care). Date to which the daily activity data relates.	n8	Format is CCYYMMDD. e.g. 14 March 2009 = 20090314.
DISDATE	Discharge Date (Hospital Provider Spell).	n8	Format is CCYYMMDD. e.g. 14 March 2009 = 20090314.
DISMETH	Discharge Method (Hospital Provider Spell).	n1	Valid national code.
CCUF	Critical Care Unit Function code.	an2	Valid national code. The code must be two characters; any leading zero must be included.
CCAC_01 - CCAC_20	Critical Care Activity Codes.	an2	Valid national codes or blank.
OPER_01 - OPER_20	High Cost Drugs (OPCS-4) Codes.	an4	Valid OPCS-4 codes (excluding decimal point character) or blank. Not all fields are present by default; the number of fields may be specified by the user in the Record Definition File. The PCC MDS specifies two procedure codes only.

Field	Description	Format	Validation/Notes
DIAG_01 - DIAG_99	Diagnosis Codes (ICD-10).	an5	Valid ICD-10 codes (excluding decimal point character and any dagger/asterisk suffix) or blank. Not all fields are present by default; the number of fields may be specified by the user in the Record Definition File.

Each row of the input file represents one Paediatric Critical Care day.

2.2.7 Neonatal Critical Care

The Grouper sorts Neonatal Critical Care prior to grouping so that records with the same Provider Code and local identifier are placed in activity date order.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Field	Description	Format	Validation/Notes
PROCODET	Provider Code	an8	The provider's Organisation Data Services (ODS) code is recommended. Any characters in excess of eight will be ignored in sorting, possibly causing incorrect grouping. A value must be supplied.
CCLocalID	A unique local activity identifier used to identify a Critical Care Period	an8	Should be the same for every daily record within a Critical Care Period i.e. not a unique record identifier. Any characters in excess of eight will be ignored in sorting, possibly causing incorrect grouping. A value must be supplied
CCDate	Activity Date (Critical Care). Date to which the daily activity data relates	n8	Format is CCYYMMDD. e.g. 14 March 2009 = 20090314.
DISDATE	Discharge Date (Hospital Provider Spell)	n8	Format is CCYYMMDD. e.g. 14 March 2009 = 20090314.
CCUF	Critical Care Unit Function code	an2	Valid national code.
AGE_DAYS	Patient age in days	n3	The baby's age on the date of the record. Integer in whole days. Range: 0 – 999.
DISMETH	Discharge Method (Hospital Provider Spell)	n1	Valid national code.
GestLen	Gestation Length (at delivery) measured in whole weeks	n2	The number of completed weeks of the gestation period. Range: 10 – 49.

Field	Description	Format	Validation/Notes
PERWT	Person Weight.	n3.n3	The weight of the baby on the date of the record. Kilograms, to 3 decimal places. Range: greater than zero kg and less than 10 kg. Leading zeroes are accepted (for compatibility with NHS Data Dictionary format).
CCAC_01 - 20	Critical Care Activity Codes.	an2	Valid national codes or blank.

Each row of the input file represents one Neonatal Critical Care day.

3 Using the Grouper

A grouping run requires two files, an input file and a Record Definition File.

3.1 Input file

The input file contains the data for grouping (e.g. Admitted Patient Care episodes). It is essential that an input file is in the appropriate format and includes all fields required for grouping. Please refer to the 'Input File Preparation' section of this document for further information.

3.2 Record Definition File

The Record Definition File (RDF) is a text file that provides the Grouper with structural information about the positions of fields in the input file for all the mandatory fields of the relevant activity type. The set of mandatory fields in an RDF is different for each data type and so users must ensure that an appropriate RDF is selected on each grouping run.

Selecting a Record Definition File

The Grouper provides a wizard to create Custom RDFs and an editor to view and modify existing RDFs.

- **Custom RDF**, created by the user; matches the field positions of the input file.
- **Sample RDF**, provided with the Grouper installation.

Sample RDFs are located in the Grouper installation folder (typically a sub-folder of `C:\Program Files\NHS IC\`).

Sample RDF Name	Data Type
HRG4_sample_APC.rdf	Admitted Patient Care
HRG4_sample_NAC.rdf	Non-Admitted Consultations
HRG4_sample_EM.rdf	Emergency Medicine
HRG4_sample_NRD.rdf	Renal Dialysis (National Renal Dataset)
HRG4_sample_ACC.rdf	Adult Critical Care
HRG4_sample_PCC.rdf	Paediatric Critical Care
HRG4_sample_NCC.rdf	Neonatal Critical Care

The field positions specified in the RDF must match the input file exactly. For example, if an RDF specifies that EPIORDER is field number '3' then EPIORDER must be the third field in each of the input file data rows.

For grouping, it is not necessary for the RDF to specify the position of every field in the input file. Only the positions of the mandatory fields need to be specified. Please refer to the 'File Preparation' section of this document for a list of mandatory fields for each data type.

For certain data items, the RDF can be used to specify the number of repeated fields that exist in the input file. For example, in Admitted Patient Care, the number of procedure codes in the RDF is 12 by default. Where user's input file contains more than 12 procedure codes, additional procedure code fields can be included in the RDF. The number of fields cannot be decreased, only increased beyond the default value. The RDF wizard provides input boxes that enable the user to increase the number of fields where appropriate.

If an input file contains fields not specified in the RDF, the Grouper will 'ignore' them during processing and pass them through to the output file. The RDF Editor provides functionality to
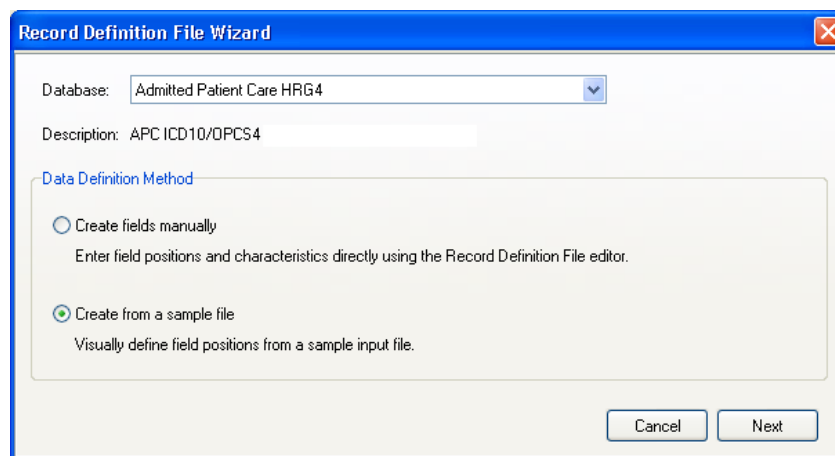
insert fields into an RDF, although this is not needed for grouping. Additional fields should only be inserted when using the internal file viewer to view output files, as the Display File… viewer only displays fields specified in the RDF.

Using the Record Definition File Wizard to Create a Custom RDF

Select '**New RDF**' from the '**File**' menu

Select required **Database** (the type of input file with which the RDF will be used)

Select **Data Definition Method** (The method by which the RDF will be created.
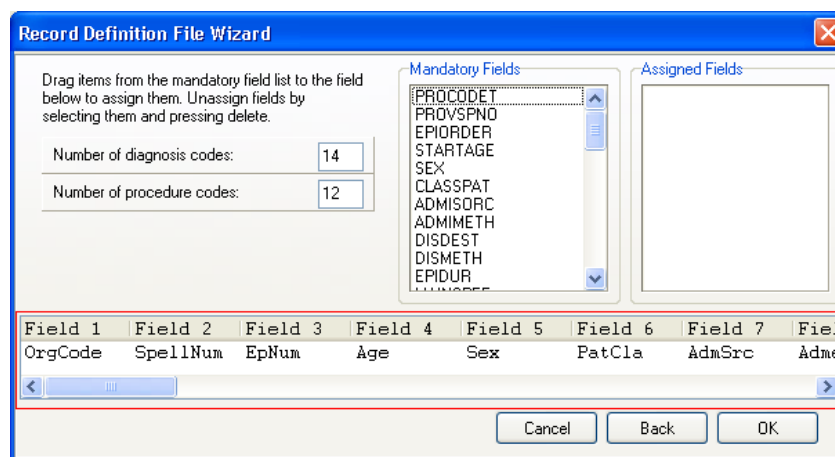

Data Definition Method

Two data definition methods are available, these are:

1. Create fields manually

This method uses a grid to define field positions and attributes. Selecting this option and clicking the 'Next' button opens the RDF editor grid where the fields can be manually defined.

2. Create from a sample file (Default)

This method facilitates the interactive creation of an RDF using a sample input file. Select **Create from a sample file** and click **Next** to use this option. The user is prompted to browse for an input file. When a file has been selected the field selection form is displayed.

The first row of the selected input file is shown in the preview area in the lower part of the form. At this stage each field is assigned a temporary field name (e.g. 'Field 1', 'Field 2').

Depending on the data type, the number of repeating occurrences of certain fields can be increased. For example, if the input file contains 20 diagnosis codes, the value in **Number of diagnosis codes** should be set to 20 rather than the default value of 14.

All field names in the **Mandatory Fields** list must be assigned to fields in the sample input file. Fields are assigned by using the mouse to drag the field name from the list to the

appropriate field in the preview area. Fields move from the **Mandatory Fields** list to the **Assigned Fields** list as they are assigned.

Multiple fields can be selected by clicking with the mouse while holding down the SHIFT and/or CTRL keys. The selected fields can then be dragged to the preview area.

If a field is erroneously assigned, it can be removed by selecting it in the **Assigned Fields** list and pressing the Delete key. The field will then appear at the bottom of the **Mandatory Fields** list.

When all fields have been assigned, click **OK** to proceed. The RDF will be opened in the RDF editor (see next section), allowing checking and any required amendments.

Record Definition File Editor

Selecting **Open RDF** from the **File** menu prompts the user to select a record definition file and opens it for editing.
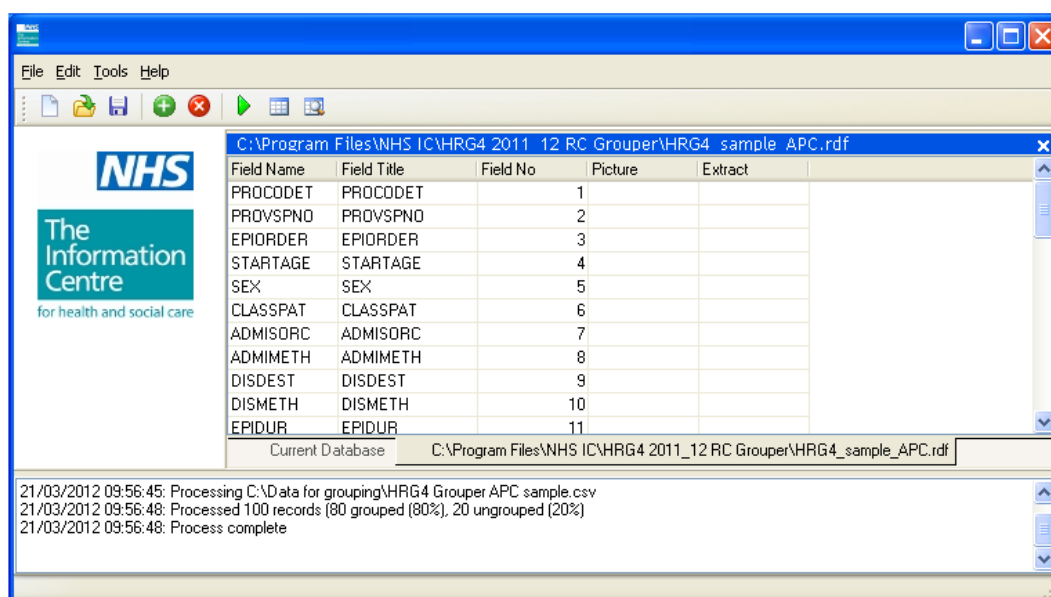
The editor allows the modification of field positions and field attributes in an RDF. The RDF columns are:

Name	Description
Field Name	A field name abbreviation for internal use; it cannot be modified.
Field Title	A field description which can be edited to display a locally-defined field name.
Field No	The field column number in the input file.
Picture	Specifies whether specific character positions in the field are used or ignored during processing. See the 'Picture' section later in this document.
Extract	Allows the user to specify that specific characters (in any position) in the field are ignored during processing. See the 'Extract' section later in this document.

The **Insert** toolbar button inserts a new field in the RDF. This feature is provided so that non-mandatory fields can be shown using the **Display File** feature. For the purposes of grouping, it is not necessary for the RDF to specify the positions of all fields in the input file. Only mandatory fields need to be specified.

The **Delete** toolbar button removes a non-mandatory field from the RDF. Mandatory fields cannot be deleted.

When the RDF is saved the user will be informed if any validation checks have been failed, e.g. conflicting field positions. Validation issues must be resolved before the file can be saved.

3.3 Menu and Toolbar

The Grouper main screen includes a menu bar and a toolbar; the available items are described below.

Menu Bar

Menu	Menu Item	Function
File	New RDF	Opens the RDF Wizard.
	Open RDF...	Opens an RDF for editing/review within the tabbed display area.
	Save	Saves an open RDF.
	Save As...	Saves an RDF with the option to rename or change location.
	Exit	Closes the application.
Edit	Insert Field	Inserts a new line in the RDF currently being edited.
	Delete Field	Deletes the selected field in the RDF currently being edited.
Tools	Process File...	Opens the Process File form.
	Single Spell...	Opens the Single Spell Grouping form.
	Display File...	Opens a file within the tabbed display area.
	Select Database...	Opens the Database Selection form.
Help	Latest User Manual	Opens a page on the Casemix website that includes the latest Grouper Reference Manual.
	About...	Displays application version and contact information.

Toolbar

Icon		Function
	New RDF	Opens the RDF Wizard.
	Open RDF	Opens an RDF for editing/review within the tabbed display area.
	Save RDF	Saves an open RDF.
	Insert Field	Inserts a new line in the RDF currently being edited.
	Delete Field	Deletes the selected field in the RDF currently being edited.
	Process File	Opens the Process File form.
	Display File	Opens a file within the tabbed display area.
	Single Spell Grouping	Opens the Single Spell Grouping form.

Tabbed Display Area
When one or more files are open (e.g. record definition files or input files), tabs are displayed at the bottom of the screen allowing each of the files to be viewed.

Current Database
The current database is shown on the main screen of the application:
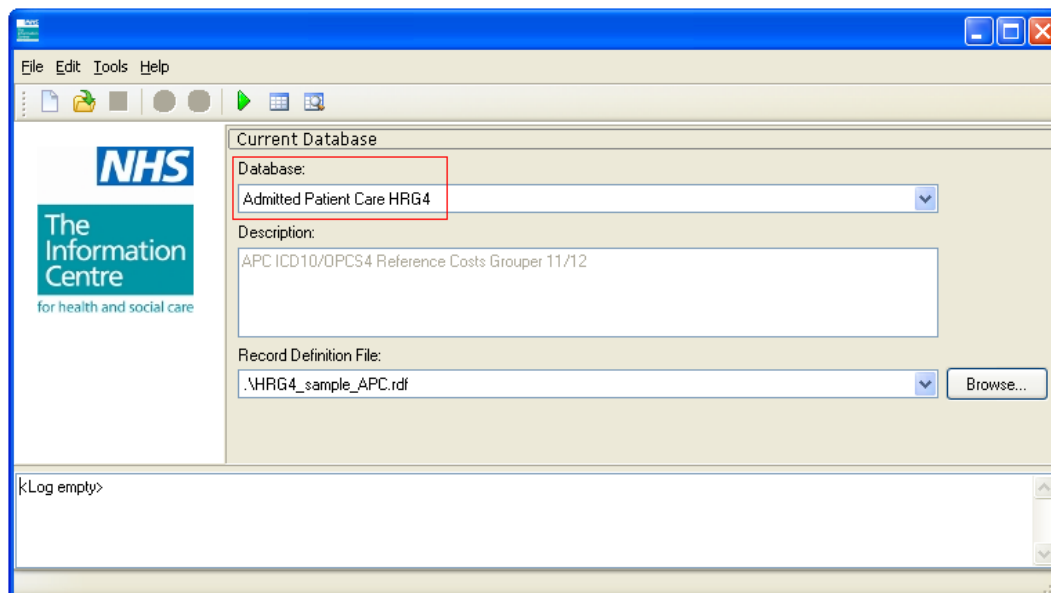
The user must ensure that the Database selected matches the data type of the Record Definition File and the type of data to be grouped. Failure to ensure that the data type of the RDF and the database match will lead to grouping errors.

The Record Definition File box indicates the currently selected Record Definition File. When the file is within the Grouper's installation folder, the full path is not shown. For files in folders outside of the Grouper's installation folder, the full file path is displayed.

When the Record Definition File box list is dropped-down it shows Record Definition Files that have been used recently. Click the browse button to locate an RDF in a different folder.
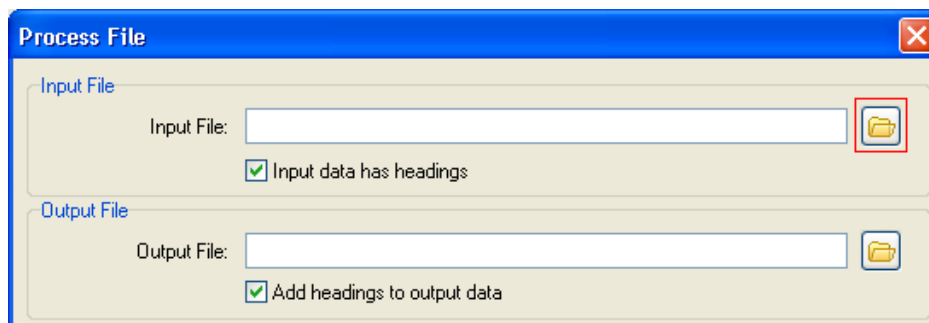
Log display area
This area displays messages about the grouping session.

3.4 Process File

Selecting **Process File...** from the **Tools** menu opens the Process File form.

Input File
In the Process File form, the input file may be selected by clicking the browse button (folder icon) next to the **Input File** box.

This displays a form prompting the user to select the input file. In that form the default setting for **Files of type** is **Input files**, meaning that only files with `.csv` and `.txt` extensions are listed. Change this value to **All Files** if the input file name has a different extension.

Input data has headings
Check this box if the input file includes field names in the first row.

Output File
This has two functions:

- To define the folder where the output files (containing grouped data) will be saved.

- To specify a file name prefix that all the output files from the grouping session will share.

For example, if the user enters `c:\temp\output.csv` then all output files will be saved to the folder `c:\temp\` and all output file names will be prefixed with '`output`'. The grouper adds to this prefix a standard file name suffix for each output file. The standard file name suffixes are described in the 'Output Files' section of this document.

Select the location and naming prefix for the output files using the browse button (folder icon) next to the output file field.

Add headings to output data
Check this box if the Grouper should add field names for Grouper-generated fields in the first row of the output files.

Reports
The Reference Costs Groupers are the only Groupers that are capable of producing reports. The 'Reports' list is not available for other Groupers. Select the reports required to be produced as part of the grouping session.

Process Button
When all selections have been made, clicking the **Process** button initiates grouping of the input file. When grouping is complete, the progress bar and the Process File form close and the application returns to the Main Screen.

3.5 Reference Costs Reports

Reference Costs Groupers have the facility to produce reports but payment groupers do not. A reports list and associated buttons are visible on the **Process File** screen in all Grouper applications but are not functional in payment Groupers.

The reports are created specifically to support the NHS Reference Costs process and are not intended for any other purpose.

Reports are produced during grouping; the reports to be created are selected by checking the appropriate boxes in the reports list in the **Process File** screen.
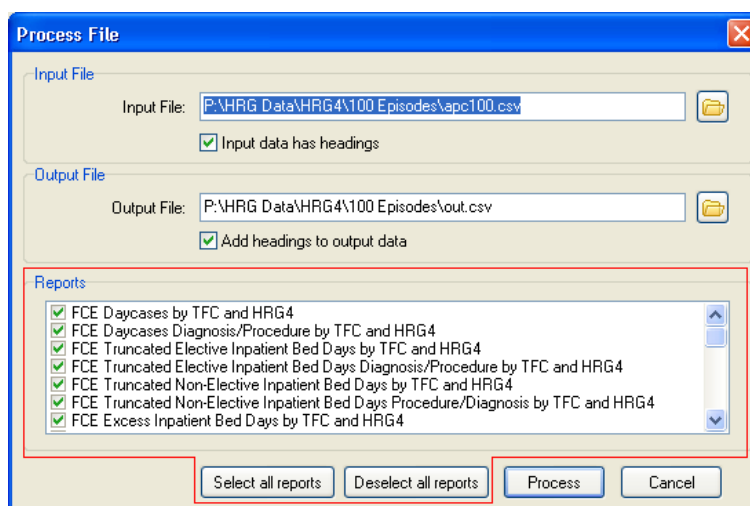
Reports are produced in Microsoft Office XML Spreadsheet format and can be opened in Microsoft Excel 2002 or later.

The number of rows in an Excel worksheet is limited, depending on the Excel version. If the number of rows in a report exceeds those permitted in Excel, an error message such as 'Problems During Load' may be displayed.

Admitted Patient Care

Truncation
Where the report title includes the word 'truncated' this means that any episodes having a duration that exceeds the reference costs trimpoint use the trimpoint as the episode duration i.e. they are truncated at the trimpoint. The excess bed days report shows the total days where trimpoints have been exceeded.

Automatic Adjustments in Admitted Patient Care reports
During report generation, one day is automatically added to the episode duration of zero-length ordinary admission episodes (Patient Classification = 1). This is in line with NHS Reference Costs guidance. This does not apply to daycases.

Episode Reports

Report Title	Command Line	Output File
FCE Daycases by TFC and HRG4	APCFCEReport001.rgf	_APCFCEReport001.xml
FCE Daycases Diagnosis/Procedure by TFC and HRG4	APCFCEReport002.rgf	_APCFCEReport002.xml
FCE Truncated Elective Inpatient Bed Days by TFC and HRG4	APCFCEReport003.rgf	_APCFCEReport003.xml

Report Title	Command Line	Output File
FCE Truncated Elective Inpatient Bed Days Diagnosis/Procedure by TFC and HRG4	APCFCEReport004.rgf	_APCFCEReport004.xml
FCE Truncated Non-Elective Inpatient Bed Days by TFC and HRG4	APCFCEReport005.rgf	_APCFCEReport005.xml
FCE Truncated Non-Elective Inpatient Bed Days Procedure/Diagnosis by TFC and HRG4	APCFCEReport006.rgf	_APCFCEReport006.xml
FCE Excess Inpatient Bed Days by TFC and HRG4	APCFCEReport007.rgf	_APCFCEReport007.xml
Unbundled HRG4 - Admitted Patient Care	APCFCEReport008.rgf	_APCFCEReport008.xml
FCE Truncated Non-Elective Long-Stay Inpatient Bed Days by TFC and HRG4	APCFCEReport009.rgf	_APCFCEReport009.xml
FCE Truncated Non-Elective Long-stay Emergency Inpatient Bed Days by TFC and HRG4	APCFCEReport010.rgf	_APCFCEReport010.xml
FCE Truncated Non-Elective Long-Stay Non-Emergency Inpatient Bed Days by TFC and HRG4	APCFCEReport011.rgf	_APCFCEReport011.xml
FCE Non-Elective Short Stay Inpatient Bed Days by TFC and HRG4	APCFCEReport012.rgf	_APCFCEReport012.xml
FCE Non-Elective Short-Stay Emergency Inpatient Bed Days by TFC and HRG4	APCFCEReport013rgf	_APCFCEReport013.xml
FCE Non-Elective Short-Stay Non-Emergency Inpatient Bed Days by TFC and HRG4	APCFCEReport014.rgf	_APCFCEReport014.xml

Spell Reports

Report Title	Command line	Output file name
Spell Daycases by HRG4	APCSpellReport001.rgf	_APCSpellReport001.xml
Spell Daycases Diagnosis/Procedure by HRG4	APCSpellReport002.rgf	_APCSpellReport002.xml
Spell Truncated Elective Inpatient Bed Days by HRG4	APCSpellReport003.rgf	_APCSpellReport003.xml
Spell Truncated Elective Inpatient Bed Days Diagnosis/Procedure by HRG4	APCSpellReport004.rgf	_APCSpellReport004.xml
Spell Truncated Non-Elective Inpatient Bed Days by HRG4	APCSpellReport005.rgf	_APCSpellReport005.xml

Spell Truncated Non-Elective Inpatient Bed Days Diagnosis/Procedure by HRG4	APCSpellReport006.rgf	_APCSpellReport006.xml
Spell Excess Inpatient Bed Days by HRG4	APCSpellReport007.rgf	_APCSpellReport007.xml
Note: there is no report 008 for Spells		
Spell Truncated Non-Elective Long-Stay Inpatient Bed Days by HRG4	APCSpellReport009.rgf	_APCSpellReport009.xml
Spell Truncated Non-Elective Long-Stay Emergency Inpatient Bed Days by HRG4	APCSpellReport010.rgf	_APCSpellReport010.xml
Spell Truncated Non-Elective Long-Stay Non-Emergency Inpatient Bed Days by HRG4	APCSpellReport011.rgf	_APCSpellReport011.xml
Spell Non-Elective Short-Stay Inpatient Bed Days by HRG4	APCSpellReport012.rgf	_APCSpellReport012.xml
Spell Non-Elective Short-Stay Emergency Inpatient Bed Days by HRG4	APCSpellReport013.rgf	_APCSpellReport013.xml
Spell Non-Elective Short-Stay Non-Emergency Inpatient Bed Days by HRG4	APCSpellReport014.rgf	_APCSpellReport014.xml

Non-Admitted Consultations

Report Title	Command line	Output file name
Non-Admitted Consultations (Excluding Chapter WF) by TFC and HRG4	NACReport001.rgf	_NACReport001.xml
Non-Admitted Consultations (Chapter WF Only) by TFC and HRG4	NACReport002.rgf	_NACReport002.xml
Unbundled HRG4 - Non-Admitted Consultations	NACReport003.rgf	_NACReport003.xml

Adult Critical Care
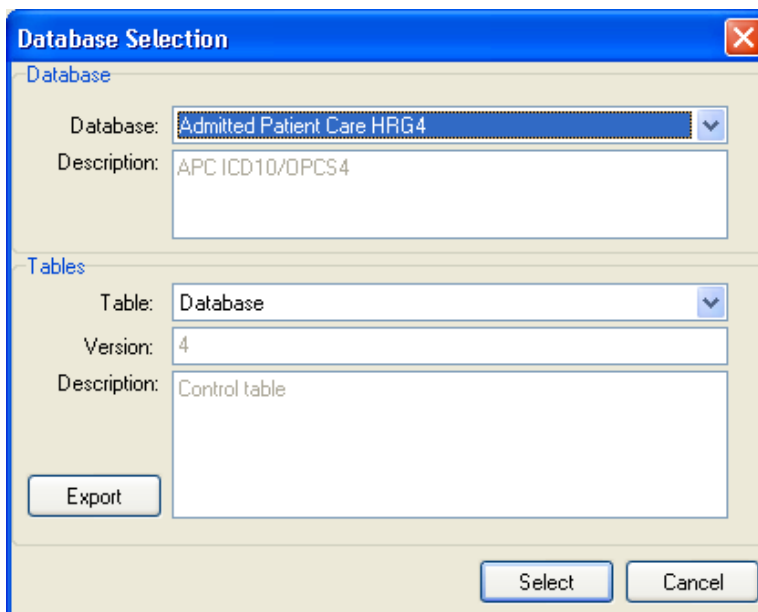
Report Title	Command line	Output file name
Adult Critical Care by HRG4	ACCReport001.rgf	_ACCReport001.xml

Emergency Medicine

Report Title	Command line	Output file name
Emergency Medicine by HRG4	EMReport001.rgf	_EMReport001.xml

3.6 Database Selection

Choosing **Select Database...** from the **Tools** menu opens the Database Selection form. This provides an alternative way of selecting the current database and a method for exporting database tables.

The **Table** drop-down box displays tables from the currently selected database.
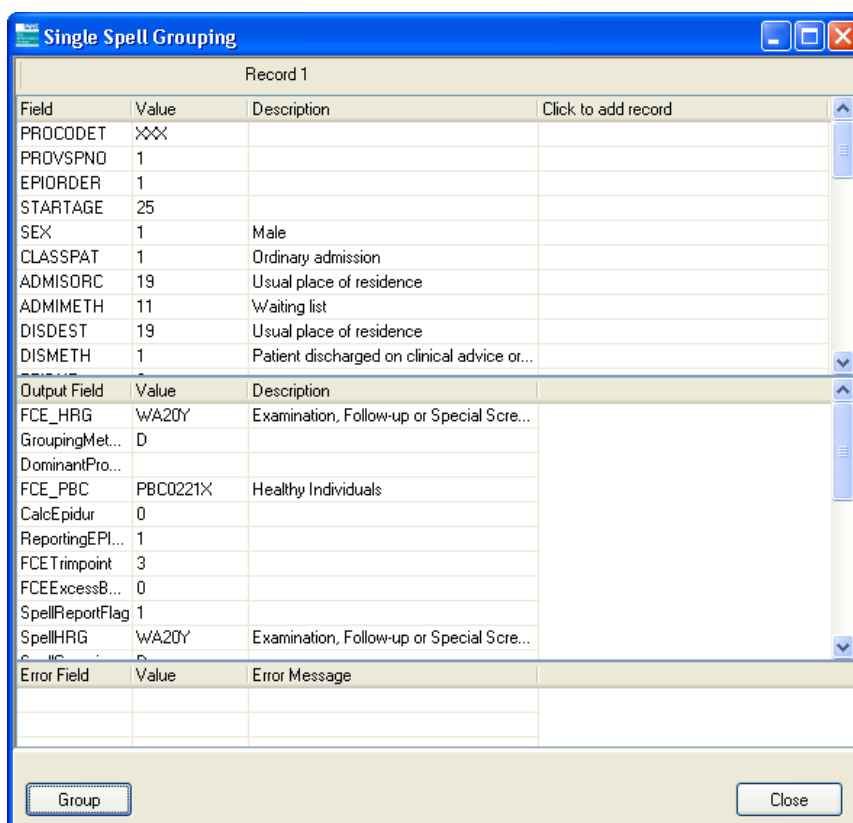
Click **Export** to export the table selected in the **Table** list, the Grouper will prompt for the export filename and location. Files are exported as comma-separated values format.

3.7 Single Spell Grouping

Selecting **Single Spell…** from the **Tools** menu opens the Single Spell Grouping form.

Single spell grouping enables the grouping of manually input data. This can be useful when exploring how certain combinations of clinical codes lead to different HRGs being derived. A database and a matching RDF must be selected in the Grouper's main screen.

The single spell grouping window is divided into three sections, the upper section is for data input, the central section is used to display output (HRGs etc.) and the lower section displays any error messages.

When the form is opened, the input section is populated with default values for the mandatory fields of the currently selected database. Data can be added or edited in the **Value** column. The Enter key must be used to confirm adding or editing a value otherwise the Grouper will ignore the new value.

The **Description** column displays the code description when a valid code has been entered.

Clicking on the **Click to add record** header bar will open an adjacent set of columns in which values for additional records, e.g. further episodes within a spell, can be entered in order to be grouped collectively. This is appropriate only when grouping either Admitted Patient Care data (where the spell HRG of a multi-episode spell may differ from the HRGs of the constituent records) or Neonatal Critical Care data (where codes in one record can affect the HRG of a later record).

Click **Group** to process the information entered and display the HRG and other derived information in the output section. Please note that the order of clinical codes can affect the HRG derived.

Where input data fails the Grouper's validation, the HRG **UZ01Z Data Invalid for Grouping** is derived. The fields that failed validation are displayed in the lower section of the window.

3.8 Log Display Area

Any problems encountered during grouping are reported in the log display area located at the bottom of the Grouper's main screen and should be checked after every grouping session. Any records that fail grouping due to data validation will be indicated in the 'ungrouped' count.

For Admitted Patient Care data, the number of 'ungrouped' in the log may not agree to the number of records in the `_quality.csv` output file. This is because the log shows the number of consultant episodes that failed validation but the quality file includes any valid episodes that form part of spells containing episodes that failed validation i.e. some of the episodes in the `_quality.csv` output file may be valid episodes that have been grouped.

All comments displayed in the log display area are also added to the `hrg.log` text file in the Grouper installation folder.

The log display area is cleared when the Grouper is closed.

3.9 Grouper Priority

The grouping process can use a large amount of processor resource. On some computers this can make other applications slow or unresponsive during grouping. To reduce impact on other applications the Grouper's priority can be set using the radio buttons while the progress bar is displayed during file processing.
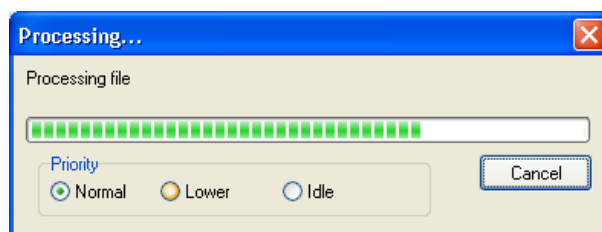
Setting	Effect
Normal	Gives the Grouper the same priority as other applications, other applications may be slowed down while the Grouper is running.
Lower	Reduces processor utilisation and gives priority to other applications.
Idle	Minimises the Grouper's use of processing resources. The Grouper will only process data when no other applications require processing resources.

Priority can be changed for the current grouping run only, each time a file is processed **Priority** will automatically be set to **Normal**.

The **Priority** options on the progress bar provide a shortcut to the thread priority settings in the Windows Task Manager. In Windows Task Manager, the same effect can be achieved by setting the grouping process (HRGGrouper.exe) priority to 'Normal', 'BelowNormal' or 'Low'.

Where the Grouper is run from the command line, the progress bar is not displayed thus there is no access to the **Priority** radio buttons. To set the priority for a grouping process run from the command line, use `-p` command line parameter or the Windows Task Manager as described above.

Warning: the grouping process priority should not be set higher than 'Normal' in Windows Task Manager. Setting the grouping process priority above 'Normal' might prevent Windows system services from running and could destabilise the system.

3.10 Displaying Files

Output files are produced in comma-separated value (.csv) format and thus can be opened using a variety of applications.

Displaying Files in Microsoft Excel

Usually, comma-separated value files are associated with Excel which means that double-clicking a .csv file opens it in Excel. On computer systems where .csv files do not by default open in Excel, select **Open…** from Excel's **File** menu. When the open file box appears, select **Text Files** from the **Files of type** drop-down box; .csv files will be displayed in the file list.
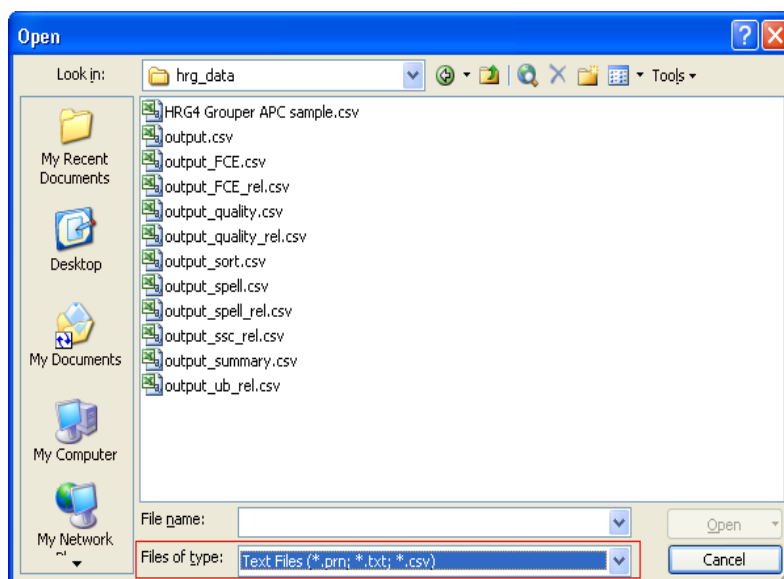
There is a limit to the number of rows in an Excel worksheet, the limit varies depending on the version of Excel. When opening a file where the number of rows exceeds the available number of worksheet rows, Excel will display an error message such as 'Problems During Load'.

The Internal File Viewer

The Grouper provides a file viewer which can be used to view Grouper output files. To access the file viewer, select **Display File...** from the **Tools** menu. This opens an open file box.
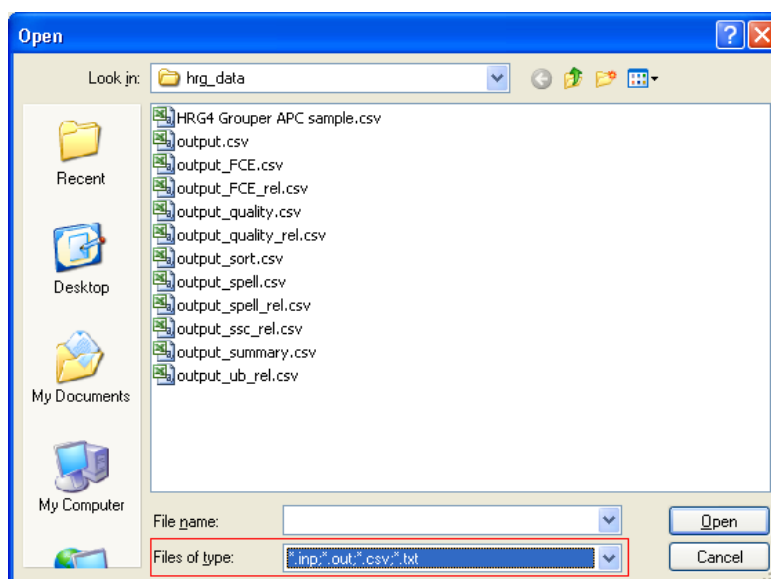
To display output files in the file list ensure that the **Files of type** drop-down list is set to "`*.inp,*.out,*.csv,*.txt`"

When a file is opened, the fields displayed are restricted to those defined in the RDF that is currently active. This means that in order to use the Display File feature to view the columns that grouping appends during file processing, an RDF must be created that includes those fields.

The field names and any Picture and Extract values (see later sections) from the RDF are applied.
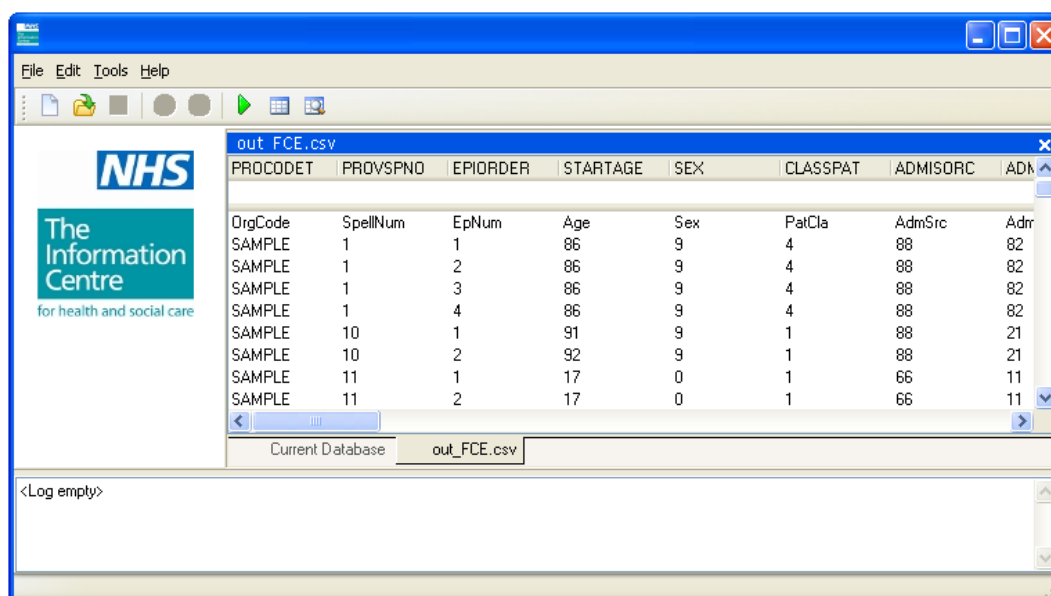
Double-clicking on a record within the display opens it in the Single Spell Grouping screen. The space beneath each field name allows the user to enter filter criteria to limit the records displayed, based on one or more starting characters. Pressing the Enter key activates the filter. The screenshot below shows the display file feature with an active filter:
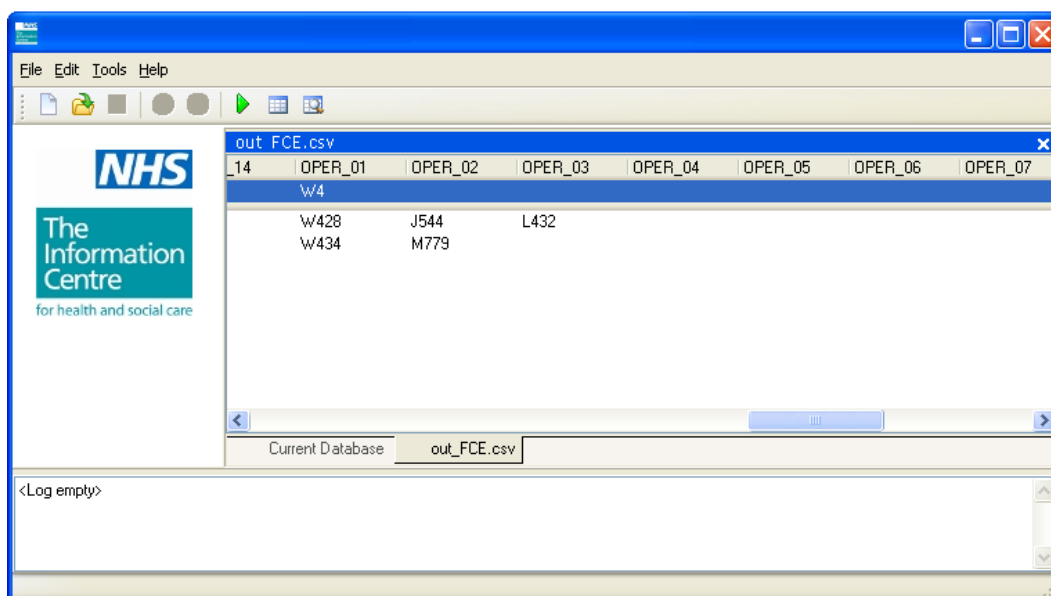
Multiple criteria can be added by entering values in more than one column.

To remove a filter criterion, delete it and press the Enter key.

3.11 Picture

Picture is a feature within the RDF that can be used to specify the inclusion or exclusion of specific character positions from input file fields. It allows the user to provide filtering instructions for each field by describing a character template. During processing the application will apply this template to the field by selectively ignoring characters in specific positions within a field.
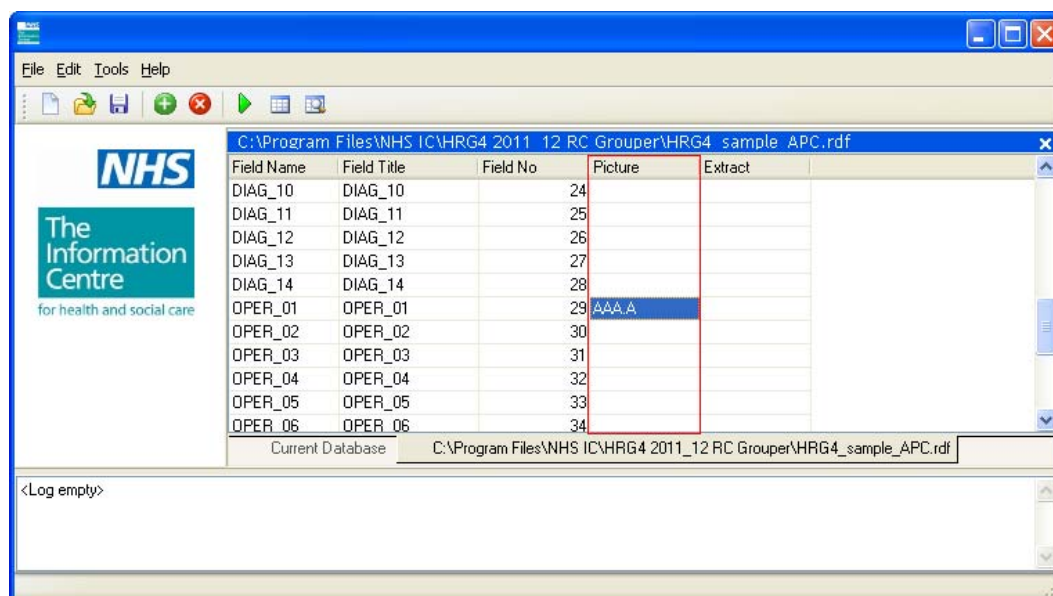
An "A" character indicates a character position to be included in grouping and a full-stop indicates a character position to be ignored in grouping. This 'picture' is then imposed on the field before grouping, meaning that the modified version of the field contents is processed by the Grouper.

To use Picture, enter a character template in the 'Picture' column of the Record Definition File using the RDF editor.

Notes:
• Characters should not be separated by spaces.
• Quotation marks should not be used.
• Can be used with alpha and numeric fields.
• Where the number of characters in the field exceeds the number of characters specified in Picture, the application will implement the Picture on the left-most portion of the field. For this reason, care should be taken when using Picture with variable length fields as this may lead to unpredictable results.
• Picture is applied prior to data validation.
• Picture applies to file processing only; it does not affect single-spell grouping.

Picture Examples

Picture	Effect
AAA.AA	Characters 1, 2, 3, 5 and 6 are used. Character 4 is ignored
.A.AAA	Characters 2, 4, 5 and 6 are used. Characters 1 and 3 are ignored
.A.	Character 2 is used. Characters 1 and 3 are ignored
AA	Characters 1 and 2 are used (Note that full stops are not required if consecutive characters from the beginning of the field are the only characters required).

3.12 Extract

Extract is a feature of the Record Definition File (RDF) that can be used to make the Grouper ignore specific characters in input file fields, irrespective of character position.
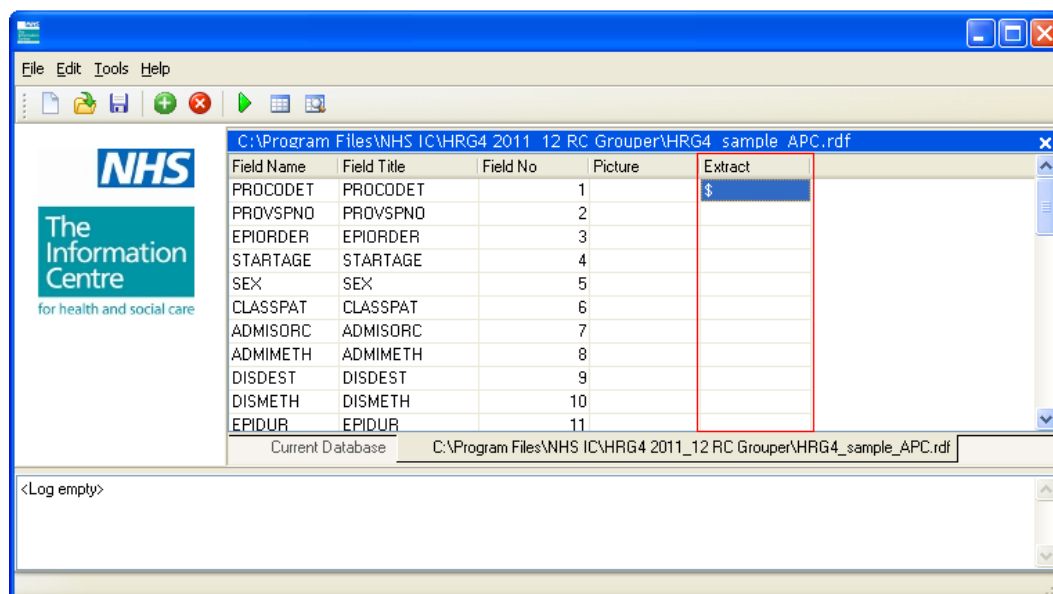
Entering one or more characters in the 'Extract' column of the RDF using the RDF editor will instruct the Grouper that any occurrence of any of these characters in that field should be ignored in grouping. (Note: Commas cannot be excluded because the input files are comma-separated).

The application does not consider a series of characters as a string of characters to be ignored as a single entity. Each character entered is ignored wherever it appears in the field.

Notes:
• The characters specified will be ignored wherever they appear in the field.
• The position of a character in the extract field does not affect how it is used.
• All occurrences of the characters are affected.
• Extract is applied prior to data validation.
• Extract applies to file processing only; it does not affect single-spell grouping.

Extract Field Examples
The examples below are shown in quotation marks (' ') to help identify the examples. Quotation marks should not be entered when using the Extract function (unless the user also wishes to extract quotation marks).

Example 1
Entering an Extract character of '.' informs the application that all occurrences of a decimal place or full-stop should be ignored when processing that field. This is a convenient way to remove decimal points from a field in the input file. A field containing the character string 'abc…d' will be interpreted by the application as 'abcd'.

Example 2
Entering the characters '+$' in this field informs the application that any occurrences of both the '+' character and the '$' character are to be ignored by the application when processing that field. A field containing the character string '46+$$++' will be interpreted by the application as '46'.

3.13 Command Line Operation

'Command line' refers to the character-based command shell user interface within Microsoft Windows. The Grouper can process a file using the command line and parameters shown below. Mandatory parameters are enclosed within <angle brackets>; optional parameters are enclosed within [square brackets]. All parameters consist of a hyphen followed by a lower-case letter.

The command line takes the following form:

```
HRGGrouper -i<Input File> -o<Output File> -d<Record Definition
File> -l<Grouping Logic> [-h] [-t] [-p] [-r<report filename>]
```

Command line parameters:

-i   The path and filename of the **i**nput input file.

-o   The path and filename of the **o**utput file.

-d   The path and filename of the record **d**efinition file.

-l   The grouping **l**ogic (see 'Grouping Logic Parameter' below).

-h   Optional. Where present, indicates that the input file has a **h**eader row (field names). Omit this parameter where the first row in the file is a data row.

-t   Optional. Where present, stops generation of field names in **t**op row of output file. If this parameter is omitted then each of the output files will contain a header row.

-p   Optional. Where present, sets the **p**riority of the grouping process. The available values are 1, 2 and 3. 1='Normal' (Grouper priority equal to that of other applications), 2='Lower' (Grouper yields to other applications), 3='Idle' (Grouper only processes data when other applications don't require processor time).
If this parameter is omitted, the priority is set to 1 ('Normal').

-r   Valid in Reference Costs Grouper only. Optional. Where present, specifies one of the built-in reports (see list in reports section below). The -r flag can be repeated to specify the production of more than one report. The report names are the filenames of .rgf files supplied as part of the Grouper installation. See the Reports section of this document for further information about the available reports.
If this parameter is omitted, reports are not produced.

-?   Optional. Where present, directs the Grouper to list the available command line parameters to the hrg.log file in the Grouper program folder. This parameter cannot be combined with other parameters.

Where there are spaces in paths or filenames for parameter values, the parameter value must be enclosed within double-quote characters.

Grouping Logic Parameter

This parameter informs the Grouper of the type of input data (e.g. Admitted Patient Care) to be processed. The parameter is the name one of the .tre files included with the Grouper installation.

Valid grouping logic parameters can be identified by using Windows Explorer to view the all the .tre files in the Grouper application installation folder (typically a sub-folder of C:\Program Files\NHS IC\). Displaying the contents of the folder using the 'Details' view (available from the **View** menu) and sorting the file list by 'Type' will place all of the files of type 'TRE File' together.

The filenames of the .tre files consist of a prefix indicating the data type to which the file relates followed by an underscore character followed by an abbreviation indicating the Grouper to which the file belongs (plus the .tre extension).

The data type to which a `.tre` file relates can be identified by the filename prefix; these are tabulated below:

Prefix	Data Type
apc_	Admitted Patient Care
nap_	Non-Admitted Consultations
em_	Emergency Medicine
nrd_	Renal Dialysis (National Renal Dataset)
acc_	Adult Critical Care
ncc_	Neonatal Critical Care
pcc_	Paediatric Critical Care

Note: for the Local Payment Grouper, the main part of the filename ends in the lower-case equivalent of LP as an abbreviation for 'Local Payment'; the penultimate character being the twelfth letter in the alphabet, not the numerical digit representing 'one'.

The path to the `.tre` file must not be included in the `-l` parameter; the parameter should be the filename only (inclusion of the `.tre` extension is optional). The path is not required because the `.tre` file must be in the Grouper's installation folder.

Working Directory
Before running the Grouper from the command line, the working directory should be set to the directory of the appropriate Grouper executable (HRGGrouper.exe). Use full path names for the input file, the output file and the record definition file where they are located in other directories.

Grouping Messages
Messages generated by the application while running in command-line mode (e.g. the number of records processed) are written to the `hrg.log` file in the Grouper's installation folder.

Command Error Messages
Errors in the command line, such as specifying a non-existent input file, cause an entry to be created in the `hrg.log` file. In addition, a non-zero exit code is returned. This means that a batch file or command file can check whether a command has passed validation by checking the value of `%errorlevel%`.

Using the Command Line in a Batch File
The following shows how a command line instruction to run the Grouper can be incorporated into a batch file. This example is for a reference costs Grouper and thus the command line includes the `-r` parameter. Grouper-specific text for the installation folder and the grouping logic parameter are represented by placeholder text surrounded by hash (#) symbols.

```
@echo off

C:

cd "Program Files\NHS IC\#grouperFolderName#"

HRGGrouper -i "C:\HRG Data\apc100.CSV" -o "C:\HRG
Data\output.csv" -d "HRG4_sample_APC.rdf" -l #groupingLogic.tre# -h
-p 3 -r APCFCEReport001.rgf -r APCFCEReport002.rgf

IF %ERRORLEVEL% NEQ 0 echo Error in command, please check hrg.log

Pause
```

4 Field Use in Grouping

The following tables provide brief descriptions about how fields are used by the Grouper.

Admitted Patient Care

PROCODET	Spell identification and sorting
PROVSPNO	Spell identification and sorting
EPIORDER	Sorting: sort order is used to help determine dominant procedure/diagnosis in spell grouping
STARTAGE	Age splits etc.
SEX	Additional checks within the grouping logic for some conditions
CLASSPAT	Reference cost reports
ADMISORC	Unbundled Paediatric and Neonatal transportation
ADMIMETH	Unbundled Paediatric and Neonatal transportation
DISDEST	In Subchapter DZ in COPD HRG
	Unbundled Specialist Palliative Care
DISMETH	Subchapter LB: Identifies live donor for kidney donation HRGs
	Subchapter PB Identifies stillbirths
	Unbundled Specialist Palliative Care
	Paediatric Critical Care
EPIDUR	Length of stay splits
MAINSPEF	Unbundling: Specialist Palliative Care
NEOCARE	Unbundling: Paediatric and Neonatal transportation
TRETSPEF	Unbundling: Specialist Palliative Care and Paediatric and Neonatal Transportation
DIAG_01	Drives diagnosis-based grouping and multiple trauma
DIAG_02 - NN	Determination of Complexity and Comorbidity splits
OPER_01 - N	All procedures are used in unbundling, multiple trauma procedures and procedure based grouping
CRITICALCARE DAYS	Modifies episode duration used in grouping
REHABILITATION DAYS	Modifies episode duration used in grouping. Used as a multiplier in unbundled rehabilitation HRG output
SPCDAYS	Modifies the episode duration used in grouping. Used as a multiplier in unbundled Specialist Palliative Care HRG output

Non-Admitted Consultations

STARTAGE	Used extensively in grouping - age splits etc
SEX	Used as additional validation within grouping logic for some conditions
MAINSPEF	Used in unbundling - Specialist Palliative Care
TRETSPEF	Used in unbundling - Specialist Palliative Care
FIRSTATT	Used to establish default HRG where procedure-based grouping does not
OPER_01 - NN	All procedures are used in unbundling and procedure based grouping

Emergency Medicine

AGE	Not used in grouping. Required for consistency with SUS validation.
INV_01 - NN	All investigation codes are used in grouping
Treat_01 - NN	All treatment codes are used in grouping

Renal Dialysis (National Renal Dataset)

RENALMOD	Primary driver for grouping used to identify the type of dialysis
RENALSITE	Secondary grouping driver for most of the HRGs; identifies treatment location (e.g. hospital)
RENALACCESS	Sub-divides HRGs based on type of dialysis access
HBV	
HCV	These fields drive fine-tuning of HRG derivation
HIV	
AGE	Used as an HRG modifier

Adult Critical Care

CCUF	Validation only
All others	Used in grouping logic

Paediatric Critical Care

PROCODET	Provider identification and sorting
CCLocalID	Local use in record identification and sorting
CCDate	Local use in record identification and sorting
DisDate	Used in conjunction with DisMeth
DisMeth	Death can act as an HRG escalator
CCUF	Other than validation, not used
CCAC_01 - NN	The main driver for HRG grouping of each day's record
OPER_01 - NN	Identifies use of certain drugs
DIAG_01 - NN	Identifies burns and isolation

Neonatal Critical Care

PROCODET	Provider identification and sorting
CCLocalID	Local use in record identification and sorting
CCDate	Local use in record identification and sorting
DisDate	Used in conjunction with DisMeth
CCUF	Used in validation and some HRG escalation logic
Age_Days	Low values can acts as an HRG escalator
Dis_Meth	Death can act as an HRG escalator
GestLen	Low values can acts as an HRG escalator
PerWt	Low values can acts as an HRG escalator
CCAC_01 - NN	The main driver for HRG grouping of each day's record

5 Output Files

In the text below and the tables in the following pages, the file name supplied by the user during processing is referred to as `[name]`; the remainder of the file name is a standard suffix that is appended by the Grouper.

A single input file produces a number of output files. User requirements determine which files are used; some users may not require certain output files. In most cases an output field appears in more than one file thus enabling users to select the files that best suit their needs.

Output files are produced as comma-separated text. These files may be opened with Microsoft Excel but very large files may exceed the maximum number of rows for Excel. In these cases an error message such as "File not loaded completely" will be displayed when attempting to open the file. The output files may be opened with a variety of applications, including Windows Notepad.

Relational Outputs

Relational output files can be identified by the presence of "`_rel`" as part of the filename. They are characterised by the following features:

- Each relational output file is only one component part of the Grouper's output; the relational output files are intended to be considered as a collection rather than being used individually.

- They include row number references in order to allow files to be linked.

- Where items are repeated (e.g. unbundled HRGs, Specialised Service Codes, error messages) this is represented by the addition of rows rather than columns.

The relational output files are supplied to support users who wish to import the Grouper output into a relational database; other users may choose to ignore them.

Specific relational output files are produced for Admitted Patient Care data and Non-Admitted Consultations data. For all data types, a relational quality output file is produced (in addition to a non-relational quality file).

The relational output files may be linked using the **RowNo** field described below.

RowNo Field

RowNo is an identifier that can be used to link rows in output files to rows in other output files. This is particularly useful in the case of the relational output files.

For example, for Admitted Patient Care, the output file `[name]_ub_rel.csv` shows the unbundled HRGs for each output row. The field **RowNo** contains the row number of the matching output record in the file `[name]_FCE.csv`. If these files are imported into a relational database, the **RowNo** fields can be used as the basis from which to derive keys to allow the relationship between these records to be represented.

Note that, depending on the file's role in a relationship with another file, **RowNo** may not contain consecutive values i.e. there may be values missing; this is by design. For example, the **RowNo** values in the `[name]_spell_rel.csv` file will contain non-consecutive values where the input data contains multi-episode spells.

Certain non-relational files include the **RowNo** of other output input files where it is considered useful to be able to link records. This is the case for `[name]_spell.csv` and the `[name]_quality.csv` files.

Iteration Field

Iteration appears in the `[name]_quality_rel.csv` and `[name]_ub_rel.csv` relational output files, it is used to distinguish between occurrences of quality messages or unbundled HRGs, respectively, that belong to the same episode. 'Iteration' contains the ordinal number of each occurrence of the type of item.

There is no significance to the numerical values of 'Iteration'; the values are assigned in order, being numbered '1', '2', '3' etc.

Iteration may be thought of as the relative column number of the row referred to by **RowNo**.

Where input row results in more than one data quality message, there will be a separate row for each data quality message in `[name]_ub_rel.csv`, each distinguished by a different number in **Iteration**.

Where an input row generates more than one unbundled HRG there will be a separate row in `[name]_ub_rel.csv`, each distinguished by a different number in **Iteration**.

RowNo and Iteration Example

An Admitted Patient Care input file has two data quality issues on row five. The output files reflect these as follows:

- `[name]_FCE.csv` - in row five there are two data quality messages.

- `[name]_quality_rel.csv` contains two rows related to the above:

    o In the first row, **RowNo** = 5 and **Iteration** = 1.

    o In the second row, **RowNo** = 5 and **Iteration** = 2.

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5.1 Admitted Patient Care

There are eleven output files.

File Name/Field Name	Description
[name].csv	A list of other output files; this file is for validation only.
[name]_sort.csv	A copy of the input data after it has been sorted into Provider Code, Spell Number and Episode Number order prior to grouping.
<input data>	All of the input data, including any non-mandatory fields.
RowNo	The row number of the record after sorting.
[name]_FCE.csv	Contains both episode and spell output fields. The spell fields are repeated for each episode in the spell; care must be taken to avoid double-counting when using spell fields.
<input data>	All of the input data, including any non-mandatory fields.
RowNo	The row number of the record after sorting.
FCE_HRG	The episode HRG.
GroupingMethodFlag	The grouping method used for the spell. P=Procedure driven, D=Diagnosis driven, M=Multiple trauma, G= Global exception.
DominantProcedure	The dominant procedure used for procedure-based grouping.
FCE_PBC	Programme Budgeting Code for the episode.
CalcEpidur	The calculated episode duration. This is the input Episode duration minus the number of days in the input field CRITICALCAREDAYS, REHABILITATIONDAYS and SPCDAYS.
ReportingEPIDUR	This field is populated by Reference Costs Groupers only. The episode duration used when generating reports. The value in this field is the same as CalcEpidur except in the case of ordinary admissions (Patient Classification=1) where CalcEpidur is zero. In these cases the value is incremented from the CalcEpidur value of zero days to one day. This reflects the fact that the reports produced by the Reference Costs Groupers are tailored specifically for Reference Costs requirements.
FCETrimpoint	This field is populated by Reference Costs Groupers only. The trimpoint for the episode HRG.
FCEExcessBeddays	This field is populated by Reference Costs Groupers only. The number of days by which the episode duration exceeds the trimpoint.
SpellReportFlag	Used in Reference Costs Groupers when generating reports from grouped data.
SpellHRG	The spell HRG.
SpellGroupingMethod Flag	The grouping method used for the spell. P=Procedure driven, D=Diagnosis driven, M=Multiple trauma, G= Global exception.
SpellDominant Procedure	The dominant procedure for the spell.

File Name/Field Name	Description
SpellPDiag	The primary diagnosis used when spell grouping.
SpellSDiag	The first secondary diagnosis used when spell grouping.
SpellEpisodeCount	The number of episodes in the spell.
SpellLOS	The spell duration used for grouping. This is the total of the CalcEpidur fields for the episodes in the spell.
ReportingSpellLOS	This field is populated by Reference Costs Groupers only. The spell duration used when generating reports. This is the total of the ReportingEPIDUR fields for the episodes in the spell.
SpellTrimpoint	This field is populated by Reference Costs Groupers only. The trimpoint for the spell HRG.
SpellExcessBeddays	This field is populated by Reference Costs Groupers only. Number of days by which the spell duration exceeds the trimpoint.
SpellCCDays	The number of critical care days in the spell.
SpellPBC	Programme Budgeting Code for the spell.
UnbundledHRGs	Variable number of fields containing unbundled HRGs (episode level) Unbundled HRGs appended to the end of each record. There may be zero, one or more unbundled HRGs per record. There is no significance to the order in which unbundled HRGs are output. For Specialist Palliative Care and Rehabilitation, unbundled HRGs, where there is more than one daily HRG, field consists of an HRG, followed by an asterisk, followed by number of days, rather than HRG repeated for every day; e.g. VC18Z*20 indicates VC18Z for 20 days.
[name]_spell.csv	Contains one row per spell. Includes candidate Specialised Service Codes (SSCs), Best Practice Tariff (BPT) codes and other flags generated for the spell.
RowNo	Matches the RowNo field of the first episode record for the spell in the [name]_FCE.csv file.
PROCODET	The organisation code from the input file.
PROVSPNO	The hospital provider spell number from the input file.
SpellHRG	The spell HRG.
SpellGroupingMethod Flag	The grouping method used for the spell. "P"=Procedure driven, "D"=Diagnosis driven, "M"=Multiple trauma, "G"= Global exception.
SpellDominant Procedure	The dominant procedure for the spell.
SpellPDiag	The primary diagnosis used for spell grouping.
SpellSDiag	The first secondary diagnosis used for spell grouping.
SpellEpisodeCount	The number of episodes in the spell.

File Name/Field Name	Description
SpellLOS	The spell duration used for grouping.
ReportingSpellLOS	This field is populated by Reference Costs Groupers only. The spell duration used when generating reports.
SpellTrimpoint	This field is populated by Reference Costs Groupers only. The trimpoint for the spell HRG.
SpellExcessBeddays	This field is populated by Reference Costs Groupers only. The number of days by which the spell duration exceeds the trimpoint.
SpellCCDays	The number of critical care days in the spell.
SpellPBC	Programme Budgeting Code for the spell.
SpellSSC_Ct	Number of distinct SSCs produced for the spell.
SpellSSC1-SpellSSC7	Candidate Specialised Service Codes for the spell. Grouper does not check eligibility - please refer to Department of Health guidance for organisational eligibility. Populated by payment Groupers only.
SpellBP_Ct	Number of distinct BPTs produced for the spell.
SpellBP1 to SpellBP7	Candidate Best Practice Tariff codes for the spell. Grouper does not check eligibility - please refer to Department of Health guidance for organisational eligibility. Populated by payment Groupers only.
SpellFlag_Ct	Number of distinct other flags produced for the spell.
SpellFlag1 to SpellFlag7	Candidate other flags for the spell. Grouper does not check eligibility - please refer to Department of Health guidance for organisational eligibility. Populated by payment Groupers only.
UnbundledHRGs	All unbundled HRGs produced for episodes in the spell. There is no significance to the order in which unbundled HRGs are output.
[name]_quality.csv	Contains a row for each episode that contains an error. Where one or more episodes within a multi-episode spell contain errors, all the episodes from the spell, including those that do not contain errors, are included in the quality file. Thus there are records in the quality file that do not include error messages.
<input data>	All of the input data for the FCE, including any non-mandatory fields, are reproduced in the output.
RowNo	Matches RowNo field of the related record in the [name]_FCE.csv file.
Error Message	A variable number of fields, each consisting of Code Type, Code and Error Message, separated by pipe (|) symbols.
[name]_FCE_rel.csv	Episode-level output in relational form.
RowNo	Matches the RowNo field of the related record in the [name]_FCE.csv file.
FCE_HRG	The episode HRG.

File Name/Field Name	Description
GroupingMethodFlag	The grouping method used for the spell. "P"=Procedure driven, "D"=Diagnosis driven, "M"=Multiple trauma, "G"= Global exception.
DominantProcedure	The dominant procedure used for procedure-based grouping.
FCE_PBC	Programme Budgeting Code for the episode.
CalcEpidur	The calculated episode duration. This is the input Episode duration minus the number of days in the input fields CRITICALCAREDAYS, REHABILITATIONDAYS and SPCDAYS.
ReportingEPIDUR	This field is populated by Reference Costs Groupers only. The episode duration used when generating reports. The value in this field is same as CalcEpidur except in the case of ordinary admissions (Patient Classification=1) where CalcEpidur is zero. In these cases the value is incremented from the CalcEpidur value of zero days to one day, reflecting that reports produced by reference costs Groupers are tailored specifically for reference cost requirement.
FCETrimpoint	This field is populated by Reference Costs Groupers only. The trimpoint for the episode HRG.
FCEExcessBeddays	This field is populated by Reference Costs Groupers only. The number of days by which the episode duration exceeds the trimpoint.
SpellReportFlag	Used in Reference Costs Groupers when generating reports from grouped data.
[name]_spell_rel.csv	Contains Spell-level output in relational form; one row per spell.
RowNo	Matches RowNo field of related record in the [name]_FCE.csv file.
PROCODET	The organisation code from the input file.
PROVSPNO	The hospital provider spell number from the input file.
SpellHRG	The spell HRG.
SpellGroupingMethod Flag	The grouping method used for the spell. P=Procedure driven, D=Diagnosis driven, M=Multiple trauma, G= Global exception.
SpellDominant Procedure	The Dominant procedure for the spell.
SpellPDiag	The primary diagnosis used when spell grouping.
SpellSDiag	The first secondary diagnosis used when spell grouping.
SpellEpisodeCount	The number of episodes in the spell.
SpellLOS	The spell duration used for grouping.
ReportingSpellLOS	This field is populated by Reference Costs Groupers only. The spell duration used when generating reports.

File Name/Field Name	Description
SpellTrimpoint	This field is populated by Reference Costs Groupers only. The trimpoint for the spell HRG.
SpellExcessBeddays	This field is populated by Reference Costs Groupers only. Number of days by which the spell duration exceeds the trimpoint.
SpellCCDays	The number of critical care days in the spell.
SpellPBC	Programme Budgeting Code for the spell.
[name]_quality_rel.csv	Relational format includes row for each episode that contains an error.
RowNo	Matches the RowNo field of the related record in the [name]_quality.csv and [name]_FCE.csv files.
Iteration	The ordinal number of the quality message.
Code Type	The type of code that has failed validation.
Code	The value of the code that has failed validation. Blank where the code is missing from the input data.
Error Message	Description of the error.
[name]_flag_rel.csv	This file is populated by payment Groupers only. Includes all distinct Specialised Service Codes (SSCs), Best Practice Tariff (BPT) codes and other flags generated for the spell. Where a spell does not generate SSCs, BPT codes or Flags this file will contain no records for that spell.
RowNo	Matches the RowNo field of the related record in the [name]_FCE.csv and [name]_spell.csv files.
PROCODET	The organisation code from the input file.
PROVSPNO	The hospital provider spell number from the input file.
Iteration	The ordinal number of the SSC, BPT or other flag.
SpellFlag	Includes all distinct Specialised Service Codes (SSCs), Best Practice Tariff (BPT) codes and other flags generated for the spell. Grouper does not check eligibility - please refer to Department of Health guidance for organisational eligibility.
[name]_ub_rel.csv	The unbundled HRGs. There are no entries for episodes that do not have any unbundled HRGs.
RowNo	Matches RowNo field of related record in the [name]_FCE.csv file.
Iteration	The ordinal number of the unbundled HRG.
UnbundledHRGs	The unbundled HRGs.There is no significance to the order in which unbundled HRGs are output.
[name]_summary.csv	A single-row file containing details about the grouping session.
Grouper Version	Version of the Grouper that produced the output files.
Database Version	Grouper's internal HRG database version.

File Name/Field Name	Description
FCE Count	Number of episodes submitted.
Spell Count	Number of spells submitted.
FCE Error Count	Number of episodes having errors.
Spell Error Count	Number of spells having errors.
Run Start Date/Time	Date and time that the grouping session started.
Run End Date/Time	Date and time that the grouping session finished.
Input Filename	Path and filename of the input file.
Output Filename	Path and filename selected by the user.
RDF path and name	Path and filename of the Record Definition File used for grouping.

5.2 Non-Admitted Consultations

There are seven output files.

File Name/Field Name	Description
[name].csv	A list of other output files used for validation only.
[name]_attend.csv	The main grouped output file.
<input data>	All of the input data, including any non-mandatory fields.
RowNo.	The row number of the record.
NAC_HRG	The attendance HRG.
GroupingMethodFlag	Grouping method used P=Procedure driven, G= Global exception.
DominantProcedure	The dominant procedure used for procedure-based grouping.
AttendSSC_Ct	The count of distinct SSCs produced for the attendance (always zero because the SSC fields are not populated).
AttendSSC1-AttendSSC5	Not populated.
AttendBP_Ct	The count of distinct BPT flags produced for the attendance (always zero because the BPT fields are not populated).
AttendBP1-AttendBP5	Not populated.
AttendFlag_Ct	The count of distinct other flags produced for the attendance (always zero because the flag fields are not populated).
AttendFlag1-AttendFlag5	Not populated.
UnbundledHRGs	A variable number of fields containing unbundled HRGs appended to the end of each record. There is no significance to the order in which unbundled HRGs are output.
[name]_quality.csv	Contains one row for each attendance that contains errors.
<input data>	All of the input data, including any non-mandatory fields.
RowNo	Matches RowNo field of the related record in the [name]_attend.csv file.
Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by 'pipe' (	) symbols.
[name]_attend_rel.csv	Output in relational form.
<input data>	All of the input data, including any non-mandatory fields.
RowNo	Matches RowNo field of the related record in the [name]_attend.csv file.
NAC_HRG	The attendance HRG.
GroupingMethodFlag	Grouping method used P=Procedure driven, G= Global exception.
DominantProcedure	The dominant procedure used for procedure-based grouping.
[name]_quality_rel.csv	All error messages in relational form. None for attendances without errors.

File Name/Field Name	Description
RowNo	Matches RowNo field of related record in the [name]_quality.csv and [name]_attend.csv files.
Iteration	The ordinal number of the quality message.
Code Type	The type of code that has failed validation.
Code	The code that failed validation. Blank if code missing from input data.
Error Message	Description of the error.
[name]_flag_rel.csv	This file is not populated.
RowNo	Not populated.
Iteration	Not populated.
AttendFlag	Not populated.
[name]_ub_rel.csv	Unbundled HRGs. There are no entries for attendances without unbundled HRGs.
RowNo	Matches RowNo field of the related record in the [name]_attend.csv file.
Iteration	The ordinal number of the unbundled HRG.
UnbundledHRG	Unbundled HRG. There is no significance to the output order.
[name]_summary.csv	A single-row file containing details about the grouping session.
Grouper Version	The version of the Grouper that produced the output files.
Database Version	The Grouper's internal HRG database version.
Attendance Count	The number of records submitted.
Attendance Error Count	The number of records having errors.
Run Start Date/Time	The date and time that the grouping session started.
Run End Date/Time	The date and time that the grouping session finished.
Input Filename	The path and filename of the input file.
Output Filename	The path and filename selected by the user.
RDF path and name	The path and filename of the Record Definition File used for grouping.

5.3 Emergency Medicine

There are five output files.

File Name/Field Name	Description
[name].csv	A list of other output files. This file is for validation only.
[name]_attend.csv	The main grouped output file.
<input data>	All of the input data including any non-mandatory fields.
RowNo	The row number of the record.
EM_HRG	The attendance HRG.
[name]_quality.csv	Contains a row for each input record that has errors.
<input data>	All of the input data including any non-mandatory fields.
RowNo	Matches the RowNo field of the related record in the [name]_attend.csv file.
Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by 'pipe' (|) symbols.
[name]_quality_rel.csv	All of the error messages in relational form. There are no entries for records that do not contain errors.
RowNo	Matches the RowNo field of the related record in the [name]_quality.csv and [name]_attend.csv files.
Iteration	The ordinal number of the quality message.
Code Type	The type of code that has failed validation.
Code	The value of the code that has failed validation. Blank where the code is missing from the input data.
Error Message	Description of the error.
[name]_summary.csv	A single-row file containing details about the grouping session.
Grouper Version	Version of the Grouper that produced the output files.
Database Version	Grouper's internal HRG database version.
Attendance Count	Number of records submitted.
Attendance Error Count	Number of records having errors.
Run Start Date/Time	Date and time that the grouping session started.
Run End Date/Time	Date and time that the grouping session finished.
Input Filename	Path and filename of the input file.
Output Filename	Path and filename selected by the user.
RDF path and name	Path and filename of the RDF used for grouping.

5.4 Renal Dialysis (National Renal Dataset)

There are five output files

File Name/Field Name	Description
[name].csv	A list of other output files, used for validation only.
[name]_renal.csv	The main grouped output file.
<input data>	All of the input data, including any non-mandatory fields.
RowNo	The row number of the record.
NRD_HRG	The HRG for the dialysis record.
[name]_quality.csv	Contains one row for each record that contains errors.
<input data>	All of the input data for the record, including any non-mandatory fields.
RowNo	Matches RowNo field of the related record in the [name]_renal.csv file.
Error Message	A variable number of fields, each consisting of Code Type, Code and Error Message, separated by pipe (	) symbols.
[name]_quality_rel.csv	All of the error messages in relational form There are no entries for records that do not contain errors.
RowNo	Matches the RowNo field of the related record in the [name]_quality.csv and [name]_renal.csv files.
Iteration	The ordinal number of the quality message.
Code Type	The type of code that has failed validation.
Code	Code that failed validation (Blank if code missing from input data).
Error Message	Description of the error.
[name]_summary.csv	A single-row file containing details about the grouping session.
Grouper Version	Version of the Grouper that produced the output files.
Database Version	Grouper's internal HRG database version.
NRD Record Count	Number of records submitted.
NRD Record Error Count	Number of records having errors.
Run Start Date/Time	Date and time that the grouping session started.
Run End Date/Time	Date and time that the grouping session finished.
Input Filename	Path and filename of the input file.
Output Filename	Path and filename selected by the user.
RDF path and name	Path and filename of the RDF used for grouping.

5.5 Adult Critical Care

There are five output files.

File Name/Field Name	Description
[name].csv	A list of other output files, used for validation only.
[name]_acc.csv	The main grouped output file.
\<input data>	All of the input data, including any non-mandatory fields.
RowNo	The row number of the record.
ACC_HRG	The unbundled HRG for the ACC period. All ACC HRGs are unbundled.
Calc_CC_Days	The number of CC days calculated as: CC Discharge Date - CC Start Date + 1 This will be set to -1 if there are problems with the dates.

CC_Warning_Flag	Flag to indicate result of validation of CC Start Date and CC Discharge Date. Date validation failure does not prevent HRG derivation.
	 'Blank' indicates valid date.
	 'F' indicates date validation failure; applied if any of the following are true:
	 • Calc_CC_Days = -1. This indicates that:
	   » CC Discharge Date is Before CC Start Date
	   » CC Start Date or CC Discharge Date:
	     - Is blank
	     - Is not a valid date
	     - Does not match the required format
	 • CCL2 Days + CCL3 Days > Calc_CC_Days
	 • ARSD + BRSD > Calc_CC_Days
	 • ARSD + BRSD > CCL2 Days + CCL3 Days

[name]_quality.csv	Contains one row for each record that contains errors.
\<input data>	All of the input data for the record, including any non-mandatory fields.
RowNo	Matches the RowNo field of the related record in the [name]_acc.csv file.
Error Message	Variable number of fields, consisting of Code Type, Code and Error Message, separated by pipe (	) symbols.
[name]_quality_rel.csv	All error messages in relational form. No entries for records without errors.
RowNo	Matches the RowNo field of the related record in the [name]_quality.csv and [name]_acc.csv files.
Iteration	The ordinal number of the quality message.
Code Type	The type of code that has failed validation.
Code	Code that failed validation (blank if code missing from input data).
Error Message	Description of the error.

File Name/Field Name	Description
[name]_summary.csv	A single-row file containing details about the grouping session.
Grouper Version	Version of the Grouper that produced the output files.
Database Version	Grouper's internal HRG database version.
ACC Period Count	Number of records submitted.
Periods Error Count	Number of records having errors.
Run Start Date/Time	Date and time that the grouping session started.
Run End Date/Time	Date and time that the grouping session finished.
Input Filename	Path and filename of the input file.
Output Filename	Path and filename selected by the user.
RDF path and name	Path and filename of the RDF used for grouping.

5.6 Neonatal Critical Care

There are six output files.

File Name/Field Name	Description
[name].csv	A list of other output files; this file is for validation only.
[name]_sort.csv	A copy of the input data after it has been sorted.
<input data>	All input data, including any non-mandatory fields.
RowNo	Row number of the record after sorting.
[name]_ncc.csv	The main grouped output file.
<input data>	All input data, including any non-mandatory fields.
RowNo	Row number of the record after sorting.
NCC_HRG	Unbundled HRG for the NCC day (All NCC HRGs are unbundled).
[name]_quality.csv	Contains one row for each record that has errors.
<input data>	All of the input data, including any non-mandatory fields.
RowNo	Matches RowNo field of related record in the [name]_ncc.csv file.
Error Message	A variable number of fields, each consisting of Code Type, Code and Error Message, separated by pipe (|) symbols.
[name]_quality_rel.csv	All of the error messages in relational form.
RowNo	Matches the RowNo field of the related record in the [name]_quality.csv and [name]_ncc.csv files.
Iteration	Ordinal number of the quality message.
Code Type	Type of code that has failed validation.
Code	Code that failed validation (blank if code missing from input data).
Error Message	Description of the error.
[name]_summary.csv	A single-row file containing details about the grouping session.
Grouper Version	Version of the Grouper that produced the output files.
Database Version	Grouper's internal HRG database version.
NCC Record Count	Number of records submitted.
NCC Record Error Count	Number of records having errors.
Run Start Date/Time	Date and time that the grouping session started.
Run End Date/Time	Date and time that the grouping session finished.
Input Filename	Path and filename of the input file.
Output Filename	Path and filename selected by the user.
RDF path and name	Path and filename of the RDF used for grouping.

5.7 Paediatric Critical Care

There are six output files.

File Name/Field Name	Description
[name].csv	A list of other output files; this file is for validation only.
[name]_sort.csv	A copy of the input data after it has been sorted.
<input data>	All input data including any non-mandatory fields.
RowNo	Row number of the record after sorting.
[name]_pcc.csv	The main grouped output file.
<input data>	All input data including any non-mandatory fields.
RowNo	Row number of the record after sorting.
PCC_HRG	Unbundled HRG for the PCC day. All PCC HRGs are unbundled.
[name]_quality.csv	Contains one row for each record that has errors.
<input data>	All input data including any non-mandatory fields.
RowNo	Matches RowNo field of related record in the [name]_pcc.csv file.
Error Message	A variable number of fields, each consisting of Code Type, Code and Error Message, separated by pipe (|) symbols.
[name]_quality_rel.csv	All of the error messages in relational form.
RowNo	Matches RowNo field of related record in the [name]_quality.csv and [name]_pcc.csv files.
Iteration	Ordinal number of the quality message.
Code Type	Type of code that has failed validation.
Code	Code that failed validation (blank if code missing from input data).
Error Message	Description of the error.
[name]_summary.csv	A single-row file containing details about the grouping session.
Grouper Version	Version of the Grouper that produced the output files
Database Version	Grouper's internal HRG database version.
PCC Record Count	Number of records submitted.
PCC Record Error Count	Number of records having errors.
Run Start Date/Time	Date and time that the grouping session started.
Run End Date/Time	Date and time that the grouping session finished.
Input Filename	Path and filename of the input file.
Output Filename	Path and filename selected by the user.
RDF path and name	Path and filename of the RDF used for grouping.

6 Error Reporting

As part of the grouping process, the Grouper carries out validation checks on many of the mandatory input fields. Where one or more fields fail validation, the Grouper derives the HRG UZ01Z (Data Invalid for Grouping).

For single-episode spells, where the episode fails validation, the error HRG is derived at both episode and spell level.

For multi-episode spells that contain a mixture of episodes that pass validation and episodes that fail validation, the error HRG is derived for each episode that fails validation and for every episode in the spell at spell level.

Details of all errors encountered are reported in a Grouper output file called the quality file. The listings in the 'Output Files' section of this document include a description of the quality file for each of the data types processed by the Grouper. The 'Input File Preparation' section provides further information regarding the field validation by the Grouper.

Details of clinical coding validation can be found in the chapter summary documentation for chapter **UZ Undefined Groups** which is available for download from the Casemix website

Error Message Format

Error messages in the quality file are displayed in three sections, the sections being separated by a pipe character. The format is a follows:

```
Code Type|Code|Error Description
```

'Code Type' identifies the field or field type

'Code' is the unrecognised value. Where an error is due to the absence of a code, this section is left blank.

'Error Description' explains the nature of the error

An example error message is:

```
ICD|P102|UZ03 - Diagnosis Conflicts with Age in DIAG_01
```

Error Types

There are three types of errors:

1) Field Validation Errors are generated where field values are missing or are outside of the accepted range of values. Example error messages of this type are:

```
ICD||Primary diagnosis is blank
ICD|XX68|Code not recognised in DIAG_01
OPCS|C992|Code not recognised in OPER_02
```

2) Spell Validation Errors result from cross checks across records in a spell. For example, where consistency checks for sex code or age are failed:

```
SEX||Not the same in all episodes in the spell
AGE||Falls in FCEs in this Spell
```

3) Clinical Coding Errors are mainly due to the use of clinical codes that do not exist in the coding system, violate clinical coding convention or are not useful resource indicators for HRG grouping.

Clinical coding errors produce error messages that contain the error category codes described in the following section.

Error Categories

Error Categories are used mainly for clinical coding errors. Critical care grouping error descriptions also include error category codes.

UZ01, Invalid Primary Diagnosis

Diagnosis code is present but should not be used in a primary position according to clinical coding conventions

```
ICD|Z509|UZ01 - Invalid Primary Diagnosis in DIAG_01
```

(Z509: Care involving use of rehabilitation procedure, unspecified)

UZ02, Poorly Coded Primary Diagnosis

Diagnosis code is valid as a primary diagnosis but is too vague to determine the resource use.

```
ICD|T140|UZ02 - Poorly Coded Primary Diagnosis in DIAG_01
```

(T140: Superficial injury of unspecified body region)

UZ03, Diagnosis Conflicts with Age

A paediatric primary diagnosis has been recorded for an adult patient (age 19 years and over).

```
ICD|P704|UZ03 - Diagnosis Conflicts with Age in DIAG_01
```

(P704: Other neonatal hypoglycaemia)

UZ04, Diagnosis Conflicts with Anatomical Site

Indicates an invalid combination of primary diagnosis and anatomical site. This only applies to specific musculoskeletal codes entered at 5th digit level.

```
ICD|M6607|UZ04 - Diagnosis Conflicts with Anatomical Site in
DIAG_01
```

(M6607: Rupture of popliteal cyst-Ankle/foot)

UZ05, Invalid Dominant Procedure

Indicates invalid dominant procedure (e.g. an anatomical site) and includes the entire Y (methods of operations) and Z (anatomical sites) codes and also a number of codes in the main body system chapters.

```
OPCS|Y841|UZ05 - Invalid Dominant Procedure in OPER_02
OPCS|W450|UZ05 - Invalid Dominant Procedure in OPER_02
```

(Y841: Gas and air analgesia in labour)
(W540: Conversion from previous prosthetic replacement of articulation of bone NEC)

UZ06, Poorly Coded Procedure

Indicates a dominant or unbundled procedure that is too vague and unspecific to determine resource use from an HRG design perspective.

```
OPCS|A579|UZ06 - Poorly Coded Procedure in OPER_02
OPCS|U019|UZ06 - Poorly Coded Procedure in OPER_01
```

(A579: Unspecified operations on spinal nerve root)
(U019: Unspecified diagnostic imaging of whole body)

UZ11, Not a Neonatal Period of Care

This is a general purpose grouping error for Neonatal Critical Care, generated when the input record does not meet any of the criteria in the neonatal critical care grouping algorithm.

UZ12, Not a Paediatric Period of Care

This is a general purpose grouping error for Paediatric Critical Care, generated when the input record does not meet any of the criteria in the paediatric critical care grouping algorithm.

UZ13, ACC Grouping Error
This is a general purpose grouping error for Adult Critical Care, generated when the input record does not meet any of the criteria in the adult critical care grouping algorithm.

UZ21, CCAC Inappropriate in NCC
Generated when the Critical Care Activity Code is inappropriate for the Neonatal Critical Care HRG algorithm

UZ22, CCAC Inappropriate in PCC
Generated when the Critical Care Activity Code is inappropriate for the Paediatric Critical Care HRG algorithm

Notes

When one error is found in a record, the Grouper doesn't stop the validation process. The grouping software aims to identify all errors and output them together.

In Admitted Patient Care data, primary diagnosis is always validated.

All clinical codes are validated against the Grouper's internal database of codes

The HRG4 Documentation Suite

The HRG4 Documentation Suite is a comprehensive resource of supporting materials, designed to assist users in understanding the design concepts, logic and practical use of the HRG4 Grouper. Below is a list of the various HRG4 documents which are available to download from the National Casemix Office website www.ic.nhs.uk/casemix

HRG4 Companion is a starting point and general reference for new and existing users, providing an introduction to HRGs, Groupers, HRG4 design concepts and grouping logic and useful links to further information.

Casemix Design Framework defines the rules and criteria followed when designing Casemix classification systems.

HRG4 Grouper Reference Manual provides full instructions on how to prepare and group data using the HRG4 Grouper software application.

HRG4 Summary of Changes provides an overview of the main changes between the current HRG4 Grouper design and its predecessor.

HRG4 Roots workbook identifies new HRGs, deleted HRGs and changes to existing HRG Labels between designs using colour-coding.
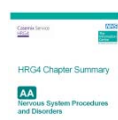
HRG4 Chapter Summaries provide an overview of the scope, composition and grouping logic of individual subchapters along with illustrative worked examples. They also include updates on the changes within subchapters.

HRG4 Code to Group workbook provides details on all mappings between primary classification codes and HRGs. Also detailed within the workbook are the logic conditions required to generate the HRGs.

HRG4 Code to Group User Manual serves as an introduction to using the Code to Group workbook to perform manual grouping. It also details some basic design concepts and provides worked examples of a variety of different grouping scenarios.

HRG4 Chapter Listings provide details, listed by HRG, of the codes that can map to those groups, along with details of flags, lists and complications and comorbidities